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DISEASES CAUSED BY BACTERIA AND FUNGI

Morrison, S. M., Fair, J. F. & Kennedy, K. K. (1961). **Staphylococcus aureus in domestic animals.**—Publ. Hlth Rep., Wash. **76,** 673-677. [Abst. from authors' summary.] **3833**

The authors' investigation revealed a high incidence of coagulase-positive, antibiotic-resistant *Staphylococcus* in horses, cattle and particularly in dogs and cats. Coagulase production, haemolytic reactions, ability to ferment mannitol, antibiotic resistances, and phage types were determined. They concluded that domestic animals might be a source of staphylococci pathogenic for man.

Live, I. & Nichols, A. C. (1961). **The animal hospital as a source of antibiotic-resistant staphylococci.** — J. infect. Dis. **108,** 195-204. **3834**

An outbreak of staphylococcal skin disease, caused chiefly by one phage type, among students at a veterinary school is described. The outbreak affected those students working in the animal hospital and it was shown that a number of dogs became infected with the same phage type after entering the hospital. The source of infection was considered to be the hospital environment.

—IAN DAVIDSON.

Sultzer, B. M. & Freedman, H. H. (1961). **Increase in nonspecific resistance to infection in mice following administration of staphylococcal extracts.** — Proc. Soc. exp. Biol., N.Y. **107,** 60-63. [Authors' summary modified.] **3835**

Intraperitoneal inoculation of staphylococcal extracts into mice protected them against a subsequent lethal challenge of *E. coli* and prolonged survival time of mice infected with *S. typhi-murium.* The same extracts produced a biphasic fever and a leucopenic response in rabbits, which soon became refractory to their action.

Cohen, J. O., Cowart, G. S. & Cherry, W. B. (1961). **Antibodies against Staphylococcus aureus in nonimmunized rabbits.** — J. Bact. **82,** 110-114. [Authors' abst. modified.] **3836**

Antibody against staphylococci was demonstrated in the serum of each of 36 non-immunized specific-pathogen-free rabbits that were tested. Two distinct staphylococcal antibodies appeared to be present in the sera from these rabbits. The sera of rabbits obtained from a commercial source contained other antibodies for staphylococci in addition to the two found in specific-pathogen-free rabbits. Normal rabbit serum from specific-pathogen-free animals could be used for differentiation of certain staphylococcal strains.

Sato, G., Miura, S., Miyamae, T., Nakagawa, M. & Ito, A. (1961). **Characters of staphylococci isolated from dead chick embryos and from pathological conditions in chickens.**— Jap. J. vet. Res. **9,** 1-13. [In English.] **3837**

Staphylococci were isolated from the yolk of 49 of 3,463 embryonated eggs in which embryos had died before reaching hatching stage. About 45% of the strains isolated were coagulase-positive and had properties of *Staph. aureus.* Most of the remaining ones liquefied gelatine. There was no marked difference between coagulase-positive strains from dead embryos and those isolated from either primary or secondary infections of fowls. A few strains from fowls were of low pathogenicity for young chicks, although they had been isolated from cases of septicaemia and from wing-tip gangrene. Of 34 coagulase-positive and 37 coagulase-negative strains,

isolated from dead embryos and lesions in adult fowls, 32 were susceptible to phages of the International Series.—E.G.

Smith, W. W., James, G. A., Miner, M. L., Blommer, E. & Jensen, M. L. (1961). **A phage-typing system for staphylococci from turkeys with synovitis.**—Amer. J. vet. Res. **22,** 388-390. [Authors' summary modified.] **3838**

Nine staphylophages were obtained from staphylococcal cultures isolated from turkeys, mice, and a soil sample. These new phages, plus bacteriophage 44A, detected marked and consistent differences among staphylococcal strains isolated from turkeys with synovitis. Outbreaks of synovitis in turkeys within a district, such as a mountain valley, were found to be caused by several strains of *Staph. aureus* different from strains occurring in distant areas.

Blair, J. E. & Williams, R. E. O. (1961). **Phage typing of staphylococci.**—Bull. World Hlth Org. **24,** 771-784. [Summary in French. Authors' summary modified.] **3839**

Standardization of methods is essential if phage typing of staphylococci is to be reliable and if the results obtained in different laboratories are to be compared. This paper, prepared on behalf of the Subcommittee on Phage Typing of Staphylococcus of the Nomenclature Committee of the International Association of Microbiological Societies, gives a detailed account of methods that have been found satisfactory for propagating the phages and defines a standard testing routine by which the stability of the phage preparations can be verified.

Pascoe, R. R. (1961). **An outbreak of bovine mastitis due to streptococci (Group "O", Lancefield).**—Aust. vet. J. **37,** 227-228. **3840**

Mastitis involved 20 cows in a herd of 25. Eight were examined and streptococci were isolated from five, *Staph. pyogenes* from 1, streptococci and staphylococci from 1, and no pathogens from 1. Eight strains of streptococci were shown to belong to Lancefield's Group O. Clinical response to antibiotics was good in early acute cases, but unsatisfactory in mastitis of long standing.—A. Culey.

Sainclivier, M. & Plommet, M. (1961). Une campagne d'éradication systématique de la mammite contagieuse à Streptococcus agalactiae. **[Campaign for systematic eradication of streptococcal mastitis in cows.]** — Rec. Méd. vét. **137,** 307-333. [Summaries in English and Spanish.] **3841**

Measures for the eradication of streptococcal mastitis in 92 farms containing 1,024 cows, 52% of which were infected, were: treatment of all 4 quarters of infected cows with 3 infusions each of 200,000 units of procaine penicillin in oily excipient at intervals of 48 hours, or 4 infusions of 50,000 units of penicillin in oily excipient at intervals of 24 hours, disinfection of teats, milking machines and cowsheds, and other hygienic precautions. Uninfected cows were treated on the first day only. The procedure was repeated 7 weeks later in farms still producing milk containing streptococci. In 65 farms where the measures were carried out correctly, 98% of 350 infected cows were cured, and in 58 of these farms the infection was eradicated. Milk production in farms freed from the disease rose by 9%.—M.G.G.

Abreu Lopes, J. A. & Braço-Forte, M. da C., Jr. (1960). Estreptococcia em suínos: otite média complicada de leptomeningoencefalite cerebelosa. **[Streptococcal otitis media in pigs, complicated by cerebellar lepto-meningoencephalitis.]**—Rev. Cienc. vet., Lisboa **55,** 298-303. [Summary in French.] **3842**

Several dozen sporadic cases of purulent otitis media complicated by cerebellar leptomeningoencephalitis were recorded in pigs of different ages. Clinical, P.M. and histological findings were described. β-Haemolytic streptococci were isolated. *Pseudomonas pyocyanea* predominated among the associated bacteria. Antibiotic therapy was successful when started at an early stage of the disease. —M.G.G.

Seifert, H. (1961). Der Antistreptolysin- und Antistaphylolysingehalt des Serums und Augenkammerwassers der Haus- und Labortiere. **[Antistreptolysin and antistaphylolysin in serum and aqueous humour of domestic and laboratory animals.]**—Z. ImmunForsch. **121,** 375-382. [Summaries in English, French and Spanish.] **3843**

Normal values for horse, ox, pig, sheep, goat, duck, fowl, goose, guinea-pig, mouse, rabbit and dog are shown in a table. Over 2,500 determinations were made. Fifty-one sick dogs were also examined and high serum antistreptolysin titres were found in cases of streptococcal sepsis, nephritis, eczema, otitis

and uraemia, while subnormal titres occurred in "actinomycosis", furunculosis, keratitis and enteritis.—R.M.

Lesslie, I. W. (1961). **The tuberculin test and the laboratory diagnosis of tuberculosis.** — Symp. zool. Soc., Lond. No. 4, pp. 11-23. [Author's summary modified.] **3844**

A brief history is given of the methods of preparation of tuberculins and the ways in which tuberculin has been applied to the diagnosis of TB. since its discovery by Koch in 1890. L. discussed procedure for characterization of tuberculins; development of the intradermal comparative tuberculin test using mammalian and avian tuberculins and its interpretation in cattle; the tuberculin test in domesticated animals other than cattle particularly in the pig; TB. eradication and laboratory help in confirmation of diagnosis; P.M. examination of positive tuberculin reactors under the Attested Herds Scheme and the isolation and typing of tubercle bacilli from animal tissues: incidence of TB. in cattle and pigs caused by the different types of tubercle bacilli. Careful typing of tubercle bacilli isolated in the laboratory is important in helping to trace the source of infection in both animals and man.

Singer, E. & Rodda, G. M. J. (1961). **Non-specific sensitization to old tuberculin: the ubiquity of acid-fast organisms.**—Tubercle, Lond. **42,** 325-332. [Authors' summary modified.] **3845**

Dust, soils, and lymph nodes and other organs from domestic animals slaughtered in Brisbane were examined for acid-fast organisms. Milk specimens from Brisbane and Cairns and a few wild mammals captured in Innisfail were also examined. 144 strains of acid-fast organisms isolated from these specimens were compared with type-strains and with 34 strains isolated from sputum in Brisbane and in an American hospital.

Ten strains of *Nocardia* and five of *Mycobacterium phlei* were recognized; 23 strains were probably *M. fortuitum;* a further seven were similar, but formed a black pigment on exposure to light and adequate concentrations of oxygen. 117 strains were similar but not identical to avian type tubercle bacilli and 'Battey' type atypical acid-fast organisms.

Of the remaining 16 strains, ten were similar to *M. butyricum* or *M. balnei,* and six formed large, orange, mucoid colonies.

Oberdorfer, A. & Lebek, G. (1961). Untersuchungen über im Rinderserum vorhandene Nährstoffe für frischgezüchtete bovine Tuberkelbakterien. **[Nutrient factors present in bovine serum for freshly-isolated bovine tubercle bacilli.]** — Z. Naturf. **16b,** 304-309. **3846**

Protein fractions isolated from bovine serum by ammonium sulphate precipitation or by ion-exchange chromatography supported the growth of bovine tubercle bacilli in synthetic nutrient medium. The protein fractions remained active after extraction with trichloracetic acid or fat solvents.—R.M.

Clauss, A. (1961). Röhrchenverschluss und Primokultur bei dem Mycobacterium tuberculosis var. bovis. **[Closure of test-tubes for primary culture of bovine tubercle bacilli.]** —Zbl. Bakt. I. (Orig.) **182,** 554-559. [Summaries in English, French, Spanish and Russian. English summary modified.] **3847**

In 51 culture growth trials of bovine tubercle bacilli, five different tube stoppers were tested. Paraffin-treated cellulose stoppers and compact rubber stoppers were best; the latter was recommended.

Dormer, B. A., Martinaglia, G. & Hobbs, W. B. (1961). **INH prophylaxis and treatment in bovines.**—S. Afr. med. J. **35,** 429-431. **3848**

After 74% of the 115 cattle in a dairy herd had given positive or doubtful reactions to the tuberculin test, all the animals were placed on a course of treatment with isoniazid, the daily oral dose being 45 g. for adults graded down to 15 g. for calves. All calves were treated within 7 days of birth. The treatment of adults ceased after 2¼ years, and calves and heifers continued to be treated until the age of 2½ years. Coughing stopped and the general condition and milk yield of the animals improved. Out of 23 of the original positive reactors examined P.M., 20 were without lesions and did not yield tubercle bacilli. Of the 70 calves born, only 3 developed positive and 8 doubtful reactions, but the source of infection in these cases was considered to be the sawdust used as bedding from which a mycobacterium closely resembling the avian type was isolated. This strain had a strong affinity for isoniazid, growing several days earlier in medium containing 5–50 μg. of INH per ml. than in control medium.—M.G.G.

Maglione, E. & Ragni, M. (1960). La prova della tubercolina in 74 cani da pastore di allevamenti bovini infetti da tubercolosi. **[Tuberculin test on dogs on infected farms.]** —Atti Soc. ital. Sci. vet. **14,** 606-611. Discussion: pp. 611-612. [Summaries in English and French.] **3849**

Tuberculin (1 ml. of a 1 : 10 dilution of crude tuberculin) was injected i/v into 74 dogs and their temperatures were recorded at hourly intervals between 8 and 24 hours after injection. Seven gave positive febrile reactions.—R.M.

Bojalil, L. F. & Bastarrachea, F. (1961). **Reliability of the niacin test as an aid in classifying human and bovine strains of tubercle bacilli in epidemiologic studies.** — Amer. Rev. respir. Dis. **84,** 272-275. [Authors' summary modified.] **3850**

A survey was made on 1,091 strains of mammalian tubercle bacilli to differentiate between human and bovine strains. The niacin test was of great help. Testing pathogenicity for lab. animals is expensive, time consuming, and laborious, and should be limited only to those strains that fail to give positive niacin reactions on primary cultures. The over-all incidence of *Mycobacterium bovis* in 1,091 strains isolated from human beings including 987 pulmonary and 104 extrapulmonary cases, was only 0·46%.

Francis, J. (1961). **The effect of age on the susceptibility of guinea pigs to tuberculosis.** —Tubercle, Lond. **42,** 333-336. [Author's summary modified.] **3851**

Guinea-pigs of various ages were infected i/p with bovine or human tubercle bacilli. The average survival times were : — new-born g.pigs, 46 days; month-old, 77 days; two months old, 66 days; four months old, 54 days.

This high susceptibility in extreme youth, high resistance in 'childhood', followed by increasing susceptibility with increasing age provides direct experimental support for the large body of epidemiological evidence indicating that similar age susceptibilities occur in man.

van Rensburg, S. J. & Du Casse, F. B. W. (1960). **A note on the incidence of porcine tuberculosis in South Africa.**—J. S. Afr. vet. med. Ass. **31,** 465-468. [Abst. from authors' summary.] **3852**

Tuberculoid lesions were present in 8% of 13,000 baconers. Mesenteric nodes were as frequently involved as head nodes.

White, L. E., Jr., Penfold, T. W. & Ward, A. A., Jr. (1961). **Management of tuberculosis in monkeys.** — Vet. Med. **56,** 247-249. **3853**

The authors, faced with an outbreak of TB. in a valuable group of experimental monkeys, decided to control the disease by isoniazid as recommended by Ruch in his recent book on the care of laboratory primates. The tuberculin-positive monkeys and their cage-mates were isolated and immediately placed on isoniazid therapy at a daily dose of 80 mg./kg. given in two divided doses and continued for at least six months. The animals were kept in isolation for at least six months after the last negative tuberculin test. Eight monkeys in all were treated, seven of which reacted positively to the tuberculin test. Of these two relapsed and were successfully re-treated while one remained positive for two years and was found at necropsy to have generalized TB. The one monkey which was negative to tuberculin never became infected and it is concluded that the isoniazid therapy had protected it. It thus appears that isoniazid can protect uninfected animals from infection. Because treated and cured monkeys become negative to tuberculin, effect of treatment can be controlled.—R. N. Fiennes.

Lévy, F. M., Conge, G. A., Pasquier, J. F., Mauss, H., Dubos, R. J. & Schaedler, R. W. (1961). **The effect of BCG vaccination on the fate of virulent tubercle bacilli in mice.** —Amer. Rev. respir. Dis. **84,** 28-36. [Summaries in French and Spanish. Authors' summary modified.] **3854**

Evidence suggests that BCG vaccination does not enhance the ability of the animal to destroy or eliminate virulent bacilli at the time of injection, nor does it prevent the establishment of lesions. The beneficial effects of vaccination appear only in a later phase of the infectious process and are manifested in a retardation of bacillary multiplication.

Knorpp, F. (1961). Zur Frage der Übertragung der Geflügeltuberkulose auf das Rind. **[Transmission of avian type tuberculosis to cattle.]** —Inaug. Diss., Munich pp. 30. **3855**

Positive reactions to avian tuberculin developed in 2 cattle fed faeces from tuber-

culous fowls daily for 2 periods of 14 and 10 days, 3 weeks apart, and in 2 fed suspensions of avian type tubercle bacilli for the same periods, but not in 2 kept in contact with 6 tuberculous fowls for 9 weeks, although the food and water troughs of the fowls were situated above the manger, so that the hay became contaminated by the fowls' faeces.
—M.G.G.

Varachiu, N. & Sălăgeanu, G. (1960). Influenţa extractului tiroidian asupra reacţiei alergice la păsările tuberculoase. [**Influence of thyroid extract on the tuberculin reaction in infected poultry.**] — Lucr. Inst. Agron. Bucureşti Ser. C, No. 4 pp. 187-192. [In Roumanian. Summaries in French and Russian.] 3856

I/m doses of 0·2 ml./kg. body wt. of thyroid extract, given at 2–5 hourly intervals for 48 hours, reduced the intensity of the tuberculin reaction in experimentally infected fowls. This might explain weak or doubtful reactions obtained during the early stages of infection, when thyroid activity was stated to be stimulated by the tuberculous process.
—E.G.

Solotorovsky, M., Squibb, R. L., Wogan, G. N., Siegel, H. & Gala, R. (1961). **The effect of dietary fat and vitamin A on avian tuberculosis in chicks.**—Amer. Rev. respir. Dis. **84,** 226-235. 3857

Wogan, G. N., Solotorovsky, M., Squibb, R. L. & Siegel, H. (1961). **The serum protein and lipoprotein response to tuberculosis in chicks fed various levels of dietary fat.** — Ibid. 236-241. [Summaries in French and Spanish.] 3858

Reduction of fat concentration prolonged median survival time and reduced the number of tubercles per tissue section in the spleen. The biochemical changes in serum were correlated with infection but not with diet. Increased levels of dietary vitamin A increased the percentage of survivors among infected chicks.—R.M.

Furniss, A. L., Collins, C. H. & Marks, J. (1961). **A case of infection with avian type tubercle bacilli.** — Mon. Bull. Minist. Hlth Lab. Serv. **20,** 126-128. 3859

Avian-type tubercle bacilli were isolated repeatedly from the sputum of a 68-year-old woman with achalasia of the cardia of 17 years' standing. The woman died eventually of TB., after repeated haemoptyses. No information was obtained as to contact with birds.—E.G.

Nagayama, H., Konno, K. & Oka, S. (1961). **Formamidase in mycobacteria and its use in differentiating saprophytic mycobacteria from other mycobacteria.** — Nature, Lond. **190,** 1219-1220. 3860

An enzyme which catalyses the formation of ammonia from formamide was found only in saprophytic strains among 23 mycobacteria tested. The name formamidase is proposed by the authors.—E.V.L.

Brotherston, J. G., Gilmour, N. J. L. & Samuel, J. McA. (1961). **Quantitative studies of Mycobacterium johnei in the tissues of sheep. I. Routes of infection and assay of viable M. johnei. II. Protection afforded by dead vaccines.**—J. comp. Path. **71,** 286-299 & 300-310. [Authors' conclusions modified.] 3861

In lambs given *M. johnei* by the intravenous and oral routes progressive infections could not be detected by quantitative viable counts on liver, spleen or mesenteric lymph nodes. By oral administration of graded doses it was possible to show that the intestinal mucosa was the most probable site of multiplication. In critical studies on infection and resistance in Johne's disease it will be necessary to examine quantitatively the occurrence of the organisms in the intestine as well as in the associated lymph nodes.

By quantitative assay of *M. johnei* in the mesenteric and portal lymph nodes it was possible to show an increased clearance of the organisms from the tissue of sheep challenged intravenously, but not in orally challenged sheep. Organisms could not be detected in the liver or spleen of sheep infected by the oral route.

Subcutaneous adjuvant vaccine enhanced the sheep's ability to overcome intestinal infection while oral vaccination did not. Vaccination did not prevent the invasion of the lymph nodes of sheep challenged orally. The distribution of organisms in the mesenteric lymph nodes and intestinal mucosa was such that examination of the nodes alone would have missed a number of infected sheep. Lambs dosed with vaccine at 3 months of age were as susceptible to oral infection as those dosed at 3 weeks of age.

Bica-Popii, V. & Diaconescu, A. (1960). Frecvenţa leziunilor produse de C. pyogenes şi C. renale la porcinele şi bovinele sacrificate la ábatorul Bucureşti. [**Incidence of lesions produced by Corynebacterium pyogenes and C. renale in pigs and cattle slaughtered in**

Bucharest.] — Lucr. Inst. Agron. Bucureşti Ser. C, No. 4 pp. 135-140. [In Roumanian. Summaries in French and Russian.] **3862**

There were no corynebacterial lesions in about 1,000 adult pigs slaughtered at the Bucharest abattoir. In 12 of 130 piglets aged 1–4 months, *C. pyogenes* lesions were present in subcutaneous tissue, muscles, lungs, liver, spleen and kidneys. Of 2,270 adult cattle, only three had pyelonephritis due to *C. renale*, and 320 young cattle were free from infection.
—E.G.

Nigg, C. & Johnston, M. M. (1961). **Complement fixation test in experimental clinical and subclinical melioidosis.** — J. Bact. **82,** 159-168. [Authors' abst. modified.] **3863**

Soluble stable antigens prepared from *Pseudomonas pseudomallei* [*Pfeifferella whitmori*] gave strongly positive c.f. reactions in a dilution of 1 to 8,000 when tested with specific rabbit antiserum diluted 1 to 10,000. The test was positive in experimentally infected rabbits 9 to 11 days after infection. Infected g.pigs and monkeys showed similar results.

Zhuravlev, V. V. (1961). **[Immunization of pigs with the Roumanian attenuated Strain BP-2 of erysipelas bacillus.]**—Veterinariya, Moscow No. 7 pp. 41-42. [In Russian.] **3864**

The Roumanian vaccine was used on 81,700 pigs with good results. Immunity appeared to last 6 months.—R.M.

Potel, J. & Degen, L. (1961). Zur Serologie und Immunbiologie der Listeriose. II. Mitteilung. Untersuchungen von Fraktionen aus List. monocytogenes und eines Haptens (Allergens) für die Intrakutandiagnose der Listeria-Infektion. **[Serology and immunobiology of listeriosis. II. Antigenic fractions for the intradermal test.]** — Zbl. Bakt. I. (Orig.) **182,** 210-224. [Summaries in English, French, Spanish and Russian.] **3865**

Both specific and non-specific fractions were obtained from *L. monocytogenes* cells. Such fractions might interfere with diagnostic tests. A proteo-lipid fraction that caused specific allergic reactions in immunized and infected lab. animals and human beings was isolated. It has no antigenic properties and is non-pyrogenic.—M.G.G.

Adinarayanan, N. & Singh, S. B. (1961). **Infectious bovine keratitis with special reference to isolation of Moraxella bovis.**—Vet. Rec. **73,** 694-696. **3866**

On a government dairy farm at Mathura, India, *Moraxella* [*Haemophilus*] *bovis* was isolated from 37 calves, all under six months of age, with contagious keratitis. Random examination of 40 apparently healthy adult cattle and buffaloes of a total of 278, revealed seven carriers, two of which were cows and five buffaloes. The disease was reproduced clincially in a calf by ocular instillation of a culture suspension prepared from a freshly isolated strain. Morphological and biochemical characteristics of the organism were described.—E.G.

Winsser, J. (1960). **A study of Bordetella bronchiseptica.**—Proc. Anim. Care Panel **10,** 87-104. [Author's abst. modified.] **3867**

Haemophilus bronchisepticus is a common inhabitant of the respiratory tract and middle ear of wild, domestic, and laboratory animals, in which it can induce a carrier state or overt illness. Man can occasionally become infected. A specific antibody in the serum does not influence the carrier state but may prevent overt illness. A lowered resistance of the animal may upset the balance of the carrier state. Rather than attempt to eliminate the organism from a laboratory animal colony by vaccination and/or antibiotics, one should set up an uninfected colony and prevent the introduction of the agent by strict isolation and hygiene.

Philip, J. R. & Shone, D. K. (1960). **Some observations on oedema disease and a possibly related condition of pigs in Southern Rhodesia.**—J. S. Afr. vet. med. Ass. **31,** 427-434. [Authors' summary modified.] **3868**

An account of incidence, epidemiology and pathology. Haemolytic *Escherichia coli* serotypes isolated from oedema disease in Southern Rhodesia are the same as those found in Gt. Britain. The disease was reproduced in one pig by i/v inj. of Seitz-filtered intestinal material from 3 affected pigs.

Haemorrhagic, and sometimes diphtheritic enteritis mainly in store and fattening pigs, appears to be related to oedema disease.

Kaplan, H. M. (1958). **Treatment of escherichiosis in turtles, frogs and rabbits.** — Proc. Anim. Care Panel **8,** 101-106. [Author's summary modified.] **3869**

Chloramphenicol, given by various routes, in an initial dose of 6 mg./100 g. of living body weight, followed by 3 mg./100 g. twice daily for seven days, improved the structure of the r.b.c. and the general health of turtles, frogs and rabbits infected naturally or experimentally with *Escherichia freundii*. This pathogen causes a disease primarily of turtles now termed "escherichiosis".

Kuida, H., Gilbert, R. P., Hinshaw, L. B., Brunson, J. G. & Visscher, M. B. (1961). **Species differences in effect of gram-negative endotoxin on circulation.**—Amer. J. Physiol. **200,** 1197-1202. 3870

The authors studied the haemodynamic effects in the systemic, portal, and pulmonary circulations produced by *E. coli* endotoxin in cat, rabbit, and monkey. Gross and microscopic examination was also made of thoracic and abdominal viscera obtained from monkeys given endotoxin. The results indicate that among the experimental animals the dog is unique in its capacity to respond by immediate and intense hepatic venous constriction.

—R.M.

McCabe, W. R. (1961). **Tolerance to bacterial endotoxin produced by proliferation of Gram negative bacteria in the kidney.**—Proc. Soc. exp. Biol., N.Y. **107,** 402-404. [Author's summary modified.] 3871

Infection of the kidney by Gram-negative bacteria was capable of inducing tolerance to heterologous endotoxin. A previous study failed to demonstrate pyrogen tolerance following experimental *E. coli* peritonitis in rabbits, but these apparently conflicting observations may reflect only a difference in the two types of infection.

Soeratno (1961). **Some cases of salmonellosis in domestic animals.**—Commun. vet., Bogor **5,** 39-44. [In English. Summary in Indonesian.] 3872

In Indonesia the following salmonella organisms were isolated P.M. from either organs, blood or faeces of domestic animals: *S. cholerae-suis* from a dog and a cat, *enteritidis* from a dog, *javiana* from a bull, *stanley* from an elephant, *typhi-murium* from two calves and *weltevreden* from another calf. Whether or not salmonellosis was the cause of death in these animals was not established.

—E.G.

Dixon, J. M. S. (1961). **Rapid isolation of Salmonellae from faeces.** — J. clin. Path. **14,** 397-399. [Abst. from author's synopsis.] 3873

Brilliant green MacConkey agar was the most satisfactory solid selective medium both for direct plating and as a sub-culture medium, giving large characteristic colonies after 24 hours' incubation. Selenite F medium, inoculated with undiluted faeces, incubated at 43°C., and subcultured after six hours' incubation on to brilliant green MacConkey agar, was the most successful rapid method of enrichment, though the results were considerably inferior to those obtained after 24 hours' incubation.

Morris, B. (1961). **The transmission of anti-Salmonella agglutinins from the mother to the young in Erinaceus europaea, with some observations on the active immunization of suckling hedgehogs.**—Proc. roy. Soc. Ser. B. **154,** 369-376. [Author's abst. modified.] 3874

Transmission of passive immunity occurred both before and after birth, but the greater part of it occurred after birth. Uptake of antibody from the milk by the gut occurred during the first 20 days of lactation and probably continued up to 30 days of age. The serum titre of the young never equalled that of the mother. The milk titre shortly after birth was half the maternal serum titre and this proportion was maintained throughout lactation.

Unweaned hedgehogs given a single injection of *Br. abortus* at 9–21 days of age produced low circulating titres after 6 days, and are thus able to produce specific agglutinins during the period when antibody is being absorbed from the milk.

Mitsuhashi, S., Sato, I. & Tanaka, T. (1961). **Experimental salmonellosis. Intracellular growth of Salmonella enteritidis ingested in mononuclear phagocytes of mice, and cellular basis of immunity.** — J. Bact. **81,** 863-868. [Authors' summary modified.] 3875

Infection with salmonella of mononuclear phagocytes from the abdominal cavity of mice showed that the intracellular multiplication of a virulent strain was rapid, and phagocytes were destroyed within 3 days of incubation. However, the intracellular growth of an attenuated strain was inhibited after a slight increase in number of bacteria, and reached a "carrier state".

Serum from normal mice or from mice immunized with live or dead vaccine had no inhibitory effect on intracellular growth of the

virulent strain. Phagocytes from mice immunized with live vaccine inhibited intracellular multiplication of the virulent strain regardless of the presence of antibody in the medium, whereas the cells of mice immunized with dead vaccine did not.

Howard, J. G. (1961). **Resistance to infection with Salmonella paratyphi C in mice parasitized with a relatively avirulent strain of Salmonella typhimurium.** — Nature, Lond. **191,** 87-88. **3876**

Nineteen mice of 20 previously infected with an avirulent strain of *S. typhi-murium* survived challenge with *S. paratyphi C* which killed all the controls. It is improbable that such a high degree of resistance can be explained by the minor flagellar antigenic relationship between these species, nor would the raised phagocytic activity of the reticulo-endothelial system alone provide a satisfactory explanation. Previous parasitization of reticulo-endothelial cells by *typhi-murium* seems to inhibit subsequent multiplication within those cells of a secondarily invading salmonella, even though not of the same or closely related species.—E.V.L.

Redaelli, G. & Giolitti, G. (1960). Osservazioni sulla qualità igienica delle farine animali ad uso zootecnico. **[Contaminants of meat, fish and bone meals.]**—Atti Soc. ital. Sci. vet. **14,** 674-677. [Summaries in English and French.] **3877**

The authors examined bacteriologically 53 samples of meals. Salmonella present in 5 samples of fish meal and one of meat meal were typed as *schwarzengrund, binza, orion* and *mediolanesis* (new serotype). *Staph. aureus* and *Cl. welchii* were also common contaminants.—R.M.

Börger, K. (1961). Die Rinderbrucellose-Bekämpfung: Rückblick und Ausblick. **[Control of bovine brucellosis: retrospect and prospects.]** — Tierärztl. Umsch. **16,** 271-274. **3878**

In the German Federal Republic, the most satisfactory method of control of bovine brucellosis was (apart from culling reactors) the vaccination of heifer calves. B. discussed the value of Strain 19, differentiation between vaccination and infection titres, the slow agglutination test and doubtful reactions to serological tests. He rejected the suggested examination of milk rather than blood samples and advocated discontinuance of vaccination of cows and heifers in infected areas.—E.G.

Heuner, F. (1961). Probleme der Standardisa-Standardisierung von Brucella-Testflüssigkeiten für die Langsamagglutination. **[Problems of standardization. II. Limits of error in the standardization of brucella antigen for tube agglutination.]**—Rindertuberk. u. Brucellose **10,** 68-74. **3879**

In the tube agglutination test for brucellosis, factors such as the different sensitivity of standard sera of different origin, different electrolyte content of the medium, and variations in titre during repeated tests with the same serum and the same antigen caused slight errors which, however, do not affect the value of standardization.—M.G.G.

Amerault, T. E., Manthei, C. A., Goode, E. R., Jr. & Lambert, G. (1961). **A heat-inactivation test for differentiating specific and nonspecific agglutination reactions for bovine brucellosis.**—Amer. J. vet. Res. **22,** 564-569. [Authors' summary modified.] **3880**

The thermolability of specific and non-specific agglutinins for brucellosis found in bovine serum was studied. A heat-inactivation test (HIT) was devised to inactivate non-specific seroagglutinins encountered in the standard tube agglutination test (STT) for brucellosis. When serum samples from 143 artificially exposed and 410 naturally exposed cattle were tested by both these tests, (1) positive HIT serological reactions were obtained from all of the artificially and naturally exposed STT-suspect and reactor cattle from which *Br. abortus* was isolated; (2) negative serological reactions were obtained from 74% of the artificially and naturally exposed STT-suspect cattle from which *Br. abortus* was not isolated.

Moody, M. D., Biegeleisen, J. Z., Jr. & Taylor, G. C. (1961). **Detection of brucellae and their antibodies by fluorescent antibody and agglutination tests.** — J. Bact. **81,** 990-995. [Authors' summary modified.] **3881**

Conditions are described for three kinds of fluorescent antibody test for brucella. Sensitivity and specificity of the tests were compared with those of cultural and agglutination techniques. Positive fluorescent antibody reactions were demonstrable with smears of suspensions containing as few as 2,500 viable or non-viable brucella organisms per ml. Massive bacterial or environmental contamination did not appear to affect sensitivity or specificity. Positive agglutination reactions required suspensions containing no less than

60 million cells per ml. Higher serum antibody titres were obtained by inhibition tests than by indirect fluorescent antibody tests.

Parnas, J. & Chodkowski, A. (1961). Weitere Analyse der Virulenz und der immunogenen Eigenschaften verschiedener Brucellenstämme sowie die immunobiologische Reaktivität des immunisierten Organismus. **[Virulence and immunogenic properties of various brucella strains, and the immunobiological reactivity of the immunized animal.]** — Z. Immun-Forsch. **121**, 277-290. [Summaries in English, French, German and Spanish.] 3882

The authors compared three attenuated strains: the American Strain 19, the Russian Strain BA and their own Strain PD. Another 47 Polish brucella strains were examined and seven had properties similar to the three attenuated strains. The authors confirmed that Strain BA was less virulent for guinea-pigs than Strain 19.—R.M.

van Drimmelen, G. C. (1961). **Recent developments in the epidemiology of brucellosis in South Africa.** — Ann. Soc. belge Méd. trop. **41**, 73-79. [In English. Summaries in French, German, Spanish and Flemish. Author's summary modified.] 3883

Experience with brucella infection in southern parts of Africa reveals four epidemiologically distinct forms of the disease. (1) *Br. melitensis* infection, associated with goat and sheep farming especially Karakul sheep farming in western territories and frequently causing severe symptoms in man. (2) *Br. abortus* infection, associated with cattle farming in all parts and infrequently causing severe symptoms in other animals and man. (3) *Br. abortus-ovis* infection, fairly common in small stock in all parts, often a self-limiting and transient disease not known to be transmitted to other animals and man. infectious infertility of rams and not patho- (4) *Br. ovigenitalium* infection, causing genic for other animals and man.

Ralston, D. J. & Elberg, S. S. (1961). **Intramonocytic destruction of brucella: potentiating effect of glycine on intracellular lysozyme activity.** — J. infect. Dis. **109**, 71-80. [Authors' summary modified.] 3884

Addition of 0·03 M glycine to parasitized monocytes from normal rabbits depressed the intracellular growth of *Br. melitensis* Strain Rev Is. Glycine did not affect survival of the monocytes. The glycine effect occurred in cell cultures treated with enough streptomycin to prevent extracellular multiplication of any unphagocytized bacteria. Streptomycin alone (50 to 500 μg. per ml.) did not influence intracellular growth of the bacteria. Extracts of parasitized monocytes were shown to contain a lysozyme-like material. Together with sufficient glycine, this material accelerated lysis and killed the brucella; the rough variant of the strain was more easily affected than the smooth form. In the infected monocyte treated with glycine, a similar relationship was observed. These results suggest that glycine was taken up by the monocytes and altered the intracellular bacteria so that the lysozyme-like factor could inhibit bacterial growth.

Rozansky, R. & Sulitzeanu, D. (1961). **Failure of brucellae to develop resistance to streptomycin in laboratory animals.** — Antibiot. & Chemother. **11**, 441-444. [Authors' summary.] 3885

Mice infected with *Br. abortus* and guinea pigs infected with *Br. abortus* and *Br. melitensis* were treated with dihydrostreptomycin for various periods. Brucellae later isolated from the spleens of these animals were as susceptible to the antibiotic as the origin strain.

Kenzy, S. G., Gillespie, R. W. H. & Lee, J. H. (1961). **Comparison of Leptospira pomona bacterin and attenuated live culture vaccine for control of abortion in cattle.**—J. Amer. vet. med. Ass. **139**, 452-454. [Authors' summary modified.] 3886

Abortions associated with *L. pomona* in a herd continued for 30 days after inoculation of a commercial killed vaccine; 17 abortions were observed in 75 cows; 6 abortions occurred in a similar number of cows inoculated with an attenuated live-culture vaccine. The leptospire was isolated by inoculating urine from cows which aborted into g.pigs. It could not be recovered from foetal tissues, although leptospira-like organisms were present in stained sections of foetal liver.

Turner, L. W. (1961). **Experimental leptospirosis in the chinchilla (Chinchilla laniger).** —Cornell Vet. **51**, 420-430. [Author's summary modified.] 3887

Twenty chinchillas inoculated with *Leptospira pomona* all became infected. Leptospires were isolated from the blood from the 1st day after inoculation until death from the infection after about a week.

Haemorrhage and congestion were

common gross lesions in the lung, liver and spleen. The most common microscopic lesions were the disruption of hepatic cords, haemosiderosis of the spleen, cloudy swelling of the renal tubules, and haemorrhages in the lung. Leptospires were found in practically every organ in the body.

It is concluded that the chinchilla would be a better laboratory animal than those commonly used for the diagnosis of leptospirosis.

Füzi, M. & Csóka, R. (1961). **An egg-yolk reaction test for the differentiation of leptospirae.** — J. Path. Bact. **82,** 208-212. [Authors' summary modified.] **3888**

In an examination of 60 pathogenic strains belonging to 41 different serotypes and 11 strains of water leptospirae, it was found that saprophytic strains rapidly decomposed egg-yolk, but pathogenic strains decomposed it slowly or not at all.

Sleight, S. D. & Lundberg, A. M. (1961). **Persistence of Leptospira pomona in porcine tissues.**—J. Amer. vet. med. Ass. **139,** 455-456. [Authors' summary modified.] **3889**

The organism was isolated from porcine brain tissue up to 18 days after [? subcutaneous] inoculation, but it was not isolated from spleen, liver, and blood until the 10th day after inoculation. Leptospires were present in the kidneys from the 4th day onwards. Although there seemed to be a definite relationship between the appearance of circulating antibodies and the disappearance of organisms from blood, liver, and spleen, this did not apply to kidneys and brain.

Wagner, W. C., McEntee, K. & Gilman, H. L. (1961). **The experimental inoculation of heifers with Vibrio fetus of ovine origin.** — Cornell Vet. **51,** 441-450. [Authors' summary modified.] **3890**

Intracervical and intra-uterine inoculations were performed on nine heifers using recently isolated foetal strains of ovine *V. fetus.* The organism was recovered from seven of the nine heifers, but not longer than 28 days after inoculation. Four heifers developed low vaginal-mucus titres (1 : 100). Endometrial biopsy revealed mild endometritis in some of the heifers. Subsequent challenge with a bovine foetal strain produced infection in three control heifers but in only two of the nine heifers which had received the sheep vibrio. None of the nine test heifers developed endometritis after challenge, but two of the three controls did.

Reich, C. V., Heist, C. E. & Dunne, H. W. (1961). **Agglutinin-adsorption analysis of Vibrio fetus.**—J. Bact. **82,** 210-214. [Authors' abst. modified.] **3891**

All pathogenic strains of *Vibrio fetus* are apparently members of a single serotype. The relationship of certain selected strains was defined by complete reciprocal adsorption and cross agglutination, using formalin-treated suspensions of *V. fetus* and homologous rabbit antisera. The reactions of five strains were analysed. A system of 12 antigens and 4 haptens was necessary to reproduce the reaction pattern obtained. A somatic antigen (antigen A) was present on every strain examined. It represented about 5% of the total antigenic area of the cell surface.

Littlejohn, A. I. (1961). **Field trials of a method for the eradication of foot-rot.**—Vet. Rec. **73,** 773-780. [Author's summary modified.] **3892**

Field trials in 1957 involving 1,477 infected sheep in 15 flocks in the south of England have shown that, using the principles established by Beveridge, it is possible to eradicate foot-rot from an ordinary commercial flock, with the simplest of handling facilities and using only 10% formalin as a medicament. General observations are made on the procedure adopted and particular emphasis is placed on the importance of adequate paring of the infected foot.

Thomson, A. (1961). **The value of vaccination in the prevention of anaerobic diseases in Great Britain.**—Bull. Off. int. Epiz. **56,** 916-921. [In English. In French pp. 922-928. Summary in Spanish.] **3893**

A discussion of recent work on *Clostridium welchii* infections in sheep, and on combined clostridial vaccines.—R.M.

Stephen, J. (1961). **The isolation of the α-toxin of Clostridium welchii type A by zone electrophoresis in vertical columns.**—Biochem. J. **80,** 578-584. [Author's summary modified.] **3894**

Culture filtrates of Type A, concentrated by high-pressure ultrafiltration, were examined by zone electrophoresis and immunoelectrophoresis. The alpha-toxin was quantitatively separated from the hyaluronidase, proteolytic and theta-toxin activities. The lecithinase, haemolytic and lethal activities were electrophoretically inseparable. Immuno-

electrophoresis revealed that at least nine different antigens were present in one crude preparation and at least 25 in another. The alpha-toxin was shown to be free from the other eight antigens but was of low specific activity.

Ellner, P. D. (1961). **Fate of partially purified C^{14}-labeled toxin of Clostridium perfringens.** —J. Bact. **82,** 275-283. [Author's abst. modified.] **3895**

Labelled toxin was injected i/v into mice and rabbits. Toxin disappeared rapidly from the bloodstream with radio-activity appearing in the urine and expired air 10–20 min. later. The organs primarily responsible for uptake of toxin from the blood were liver (72%), lungs (15%), kidney (8%), and spleen (5%). The toxin was not bound to skeletal muscle. Fractionation of the liver into subcellular particles by centrifugation showed the radio-activity to be concentrated in the mitochondrial fraction.

Hirsch, H. A. & Paine, T. F., Jr. (1961). **Experimental uterine tetanus in mice.** — J. Path. Bact. **82,** 195-198. [Authors' summary modified.] **3896**

Spores of *Clostridium tetani* alone did not produce tetanus after subcutaneous or intra-uterine injection in mice. Calcium chloride, certain bacteria, and mouse embryonic tissue, were effective adjuvants in promoting tetanus infection. Spores injected together with an adjuvant into the non-pregnant mouse uterus produced tetanus about half as frequently as the spores injected subcutaneously.

The implantation of spores into the mouse uterus after abortion had been induced led to tetanus in every instance. Spores were still viable 2–6 weeks after subcutaneous or intra-uterine injection and could be activated by calcium chloride or by *Staphylococcus aureus* injected at the site of the previous spore implantation.

Flock, M. A., Yarinsky, A. & Duff, J. T. (1961). **Studies on immunity to toxins of Clostridium botulinum. VII. Purification and detoxification of trypsin-activated type E toxin.**—J. Bact. **82,** 66-71. [Authors' abst. modified.] **3897**

Purification of the toxin was accomplished by precipitation with ammonium sulphate, extraction with calcium chloride, and re-precipitation with ethanol in the cold. Purified toxins were converted to toxoid by incubation with formalin and adsorbed on aluminium phosphate. Good immune responses were obtained to the toxoids in mice, g.pigs, and rabbits.

Müller, J. (1961). Type C-botulisme hos mennesker og dyr (med saerligt henblik på sygdommens forekomst hos kvaeg og hest). [**Type C botulism in man and animals—incidence in cattle and horses.**] — Medlemsbl. danske Dyrlaegeforen. **44,** 547-557. [In Danish.] **3898**

M. discussed the literature (26 references). Studies at the State Veterinary Serum Laboratory, Copenhagen, in 1959/60 have afforded proof that most of the outbreaks of two diseases referred to in Danish legislation as "Infectious oesophageal paralysis in cattle" and "Malignant spinal cord typhus in horses", (known for at least 50 and for over 100 years respectively), are in fact botulism caused by Type C toxin.

Samples of liver from cattle and horses from field outbreaks were examined by injection of extracts into mice, and in 10 of 12 outbreaks botulinum toxin was demonstrable, often in considerable amounts. Neutralization tests in all cases examined showed that the toxin was Type C. Direct anaerobic culture from the liver samples confirmed this. The disease was reproduced in a cow and in a horse by feeding toxic liver suspensions from field outbreaks: in the cow illness occurred after 45 hours and death 41 hours later; in the horse which received about a million mouse lethal doses, *i.e.*, double the dose given to the cow, illness occurred after 18 hours and death 4 hours later. At P.M. examination of these two experimental cases only weak traces of botulinum toxin were found in duodenal content and liver, but they were examined shortly after death, whereas in the field cases several days had elapsed. Of 23 livers from cows or horses from outbreaks of botulism in the field botulinum toxin (Type C) and the presence of *Cl. botulinum* were demonstrable in 18; the toxin alone in one; the organism alone in one; and neither was demonstrable in three.

That Type C botulism is so rare in man (only two cases appear to have been recorded) is ascribed to the low toxicity of the toxin for man except in very large doses, and to the low heat-resistance of the spores (though they resisted heating at 60° for an hour, they were killed, in unpurified cultures, by 100° for 10–15 min., and Type C toxin was destroyed after 5 min. at 80°C.).—F.E.W.

Månsson, I. & Olsson, B. (1961). **The presence of anaerobic bacteria of Clostridium type in intestinal content and certain skin changes in pigs.**—Acta path. microbiol. scand. Suppl. No. 144 pp. 257-258. [In English.] **3899**

Zinc-deficiency parakeratosis produced in pigs by feeding a high-protein dry diet was accompanied by a sharp increase, at the time of appearance of skin lesions, in numbers of clostridia in the faeces (from 100 bacteria per gramme to 1,000,000). Numbers of enterococci and "resident bacteria" remained unchanged. The clostridia have not yet been classified.—R.M.

Wheater, D. W. F. & Hurst, E. W. (1961). **The effect of sex on bacterial infections in mice and on the chemotherapy of one of them.** —J. Path. Bact. **82,** 117-130. [Authors' summary modified.] **3900**

To small infecting doses of several bacterial pathogens (*Streptococcus agalactiae, Str. pyogenes, Str. pneumoniae* and *Salmonella dublin*), the female mouse is rather less susceptible than the male. Pretreatment of intact or gonadectomized animals with oestradiol promotes longer or more frequent survival than obtains with testosterone treatment or in mice not receiving hormonal therapy, but under some conditions the male hormone also exercises a beneficial influence.

The sexual difference with *Str. agalactiae* is greatly enhanced when the infection is treated with suboptimal doses of streptomycin or chloramphenicol, but not when it is treated with sulphonamides, chlortetracycline or benzylpenicillin. Under the influence of antibiotic therapy, the sexual difference is revealed also with infecting doses of organisms too large to permit its demonstration in the untreated animal.

Oestradiol appears to enhance the therapeutic effect of streptomycin in the male, stilboestrol to enhance it in the male and diminish it in the female, and testosterone to enhance it especially in the female. Oestradiol diminishes the therapeutic effect of a low dose of chloramphenicol and stilboestrol diminishes that of a higher dose as well. Testosterone appears to enhance the action of chloramphenicol in the male.

Vaccination of mice prior to infection also serves to demonstrate the greater resistance of female mice to doses of bacteria too large to allow emergence of a clear sexual difference in non-vaccinated animals. This resistance is associated with greater protective effect of female immune serum when administered to non-vaccinated mice prior to infection. The female immune serum is also a more potent inhibitor of bacterial growth.

Hagen, K. W., Jr. (1959). **Chronic respiratory infection in the domestic rabbit.**—Proc. Anim. Care Panel **9,** 55-60. [Author's summary modified.] **3901**

Chronic respiratory infection was studied in a colony of 45 mature does. Of 857 offspring 35 developed respiratory infection and died. *Pasteurella multocida* was the predominant organism isolated from respiratory tracts, being found in 54%. *Haemophilus bronchisepticus* and *Streptococcus pyogenes* were also isolated. The lungs exhibited bronchopneumonia, with consolidation and necrosis. The trachea was inflamed, and the bronchi were filled with a thick, purulent exudate. Experimental studies suggested that infection is transmitted from mother to young *via* the respiratory route within a few days of birth.

A ration containing 0·025% sulphaquinoxaline was continuously fed to 20 does and their young for 12 months. The ration was palatable and no toxic effects were noted. There were no deaths from primary pneumonia and the number of *Past. multocida* isolates fell by 70%.

Thirty-two does and their young were fed a ration containing 0·0055% furazolidone. The ration was palatable and non-toxic. The number of deaths from primary pneumonia was reduced and pasteurella could not be isolated.

Baruah, H. K. (1961). **The air spora of a cowshed.** — J. gen. Microbiol. **25,** 483-491. [Author's summary.] **3902**

Study of the air spora of a cowshed by means of a Hirst Automatic Volumetric Spore Trap showed an atmospheric concentration of fungal spores ranging from 95,000 to 16,000,000 spores/m^3. There was a direct relationship between the hours during which hay was being fed and the highest concentrations of spores. Aspergillus-Penicillium and Mucor types of spore were predominant, and hyphal fragments including conidiophores were the third most numerous component. The findings are discussed with reference to human and animal fungal disease.

Wright, M. L., Anderson, G. W. & McConachie, J. D. (1961). **Transmission of aspergillosis**

during incubation.—Poult. Sci. **40**, 727-731. [Authors' summary modified.] **3903**

Mould penetration of embryonating eggs within 8 days after dusting them with spores of *Aspergillus fumigatus* was evident by ordinary candling methods. Chicks hatched from eggs indexed as internally mouldy on the 18th day of incubation. Contamination with the infective agent was demonstrable on the down of chicks selected at random from the hatching compartment. Exposure to low concentrations of formaldehyde vapour of chicks already exposed to the fungus increased respiratory symptoms as well as the prevalence of the mould in the lungs at 10 days of age.

Codner, R. C., Cruickshank, C. N. D., Trotter, M. D. & Wood, S. R. (1961). **The production of trichophytin antigen in submerged culture of Trichophyton mentagrophytes.** — Sabouraudia **1**, 116-122. [Summary in German. Authors' abst. modified.] **3904**

Trichophyton produced in submerged cultures was sufficiently free from irritant properties to be used clinically and may be further purified for investigation of the relationship between its chemical structure and biological activity.

Dolan, M. M. & Fendrick, A. J. (1959). **Incidence of Trichophyton mentagrophytes infections in laboratory rats.**—Proc. Anim. Care Panel **9**, 161-164. [Authors' summary modified.] **3905**

An outbreak of ringworm in laboratory rats caused by *T. mentagrophytes* is reported. The carrier state may develop into overt infection when temp. and humidity are favourable. A survey of the incidence of *T. mentagrophytes* carriers revealed positive cultures in 237 of 600 rats from conventional breeding stock. All cultures from the hair of 600 rats from pathogen-free stock were negative.

Kaplan, W. & Ivens, M. S. (1961). **Observations on the seasonal variations in incidence of ringworm in dogs and cats in the United States.** — Sabouraudia **1**, 91-102. [Summary in German. Authors' abst. modified.] **3906**

There appeared to be seasonal variations in the incidence of ringworm in dogs and cats. Patterns of incidence appeared to vary with the dermatophyte involved.

O'Sullivan, J. G. (1961). **Griseofulvin treatment in experimental Microsporum canis infection in the cat.**—Sabouraudia **1**, 103-107. [Summary in French. Author's abst. modified.] **3907**

Orally administered griseofulvin caused *M. canis* infection to disappear from within the hair follicles in artificially infected cats. Clinical evidence of infection disappeared simultaneously although fluorescence persisted. Removal of the distal part of affected hairs in conjunction with the application of an anti-fungal preparation reduced the period of positive fluorescence and of the recovery of the fungus in culture.

Graham, I. C. (1961). **Study of chinchilla fur chewing.**—NCBA Res. Bull. No. 39. pp. 8. [Middletown, New York: National Chinchilla Breeders of America, Inc.] **3908**

Over 1,800 samples of fur obtained from chinchilla farms were cultured for dermatophytes; 76% of samples from fur chewers were positive, compared with 48% from chinchillas sampled at random, and 18% from ranches where fur chewing had not occurred for 2 years. *Trichophyton* was the commonest dermatophyte, followed by *Epidermophyton*, and *Microsporum*. *Apergillus* was present in almost every sample. Only a few of the chinchillas smeared with culture chewed their fur. It was suggested that ingestion of *Aspergillus* sets up a condition depleting the hair keratin of amino-acids, and this promotes the invasion of the hair by *Trichophyton*. During the past 18 months, griseofulvin in the food has been 100% effective in stopping fur-chewing.—M.G.G.

Răducănescu, H., Jitaru, G., Poenaru, I. & Stănică, I. (1960). Frecvenţa şi etiologia leziunilor de tip actinomicotic la bovinele sacrificate în ábatorul Bucureşti. **[Incidence and aetiology of actinomycosis-like lesions in cattle slaughtered in Bucharest.]**—Lucr. Inst. Agron. Bucureşti Ser. C, No. 4 pp. 127-134. [In Roumanian. Summaries in French and Russian.] **3909**

Actinomycosis-like lesions were present in 39 of 3,860 cattle slaughtered in Bucharest, but none were found in 300 buffaloes. Actinobacilli were isolated from ganglia, tongue and subcutaneous connective tissue of 97% of affected cattle, and *Actinomyces* was recovered from the bones of 95%. Actinobacilli and actinomyces were sometimes accompanied by staphylococci, streptococci, coliform organisms, pseudomonas, pasteurella, proteus, etc. A small proportion of the lesions contained neither *Actinobacillus* nor *Actinomyces*. Apart from the site of lesions,

differentiation between actinobacillosis and actinomycosis and similar lesions was by culture and microscopically.—E.G.

Phillips, J. E. (1961). **The commensal role of Actinobacillus lignieresi.**—J. Path. Bact. **82,** 205-208. [Author's summary modified.] **3910**

Organisms resembling *A. lignieresi* in morphological and biochemical characters were isolated from the ruminal contents of normal cattle. There is an antigenic relationship between these bacteria and pathogenic strains. The recovery of these organisms from normal cattle confirms the hitherto unsupported hypothesis of their commensal nature.

Bedryńska-Dobek, M. (1960). Détermination des caractères morphologiques, culturaux et biochimiques, du pouvoir pathogène et de la résistance aux antibiotiques de 9 souches de Nocardia asteroides. **[Properties, pathogenicity and resistance to antibiotics of nine strains of Nocardia asteroides.]**—Acta microbiol. polon. **9,** 343-353. [In French. Summary in Polish.] **3911**

The morphological, cultural, and biochemical properties of 9 strains of *N. asteroides* were described. Their pathogenicity for mice varied. They did not form haemolysin *in vitro*. I/v injection of mice with culture supernatant caused no toxic symptoms. Their sensitivity to antibiotics was low; only chloramphenicol, tetracycline, bacitracin and carbomycin had an inhibitory effect on more than one strain, as did high concentrations of streptomycin or isoniazid.—M.G.G.

Karib, E. A. (1961). **Contagious bovine pleuropneumonia in the Sudan.** — Bull. Off. int. Epiz. **56,** 900-906. [In English. In French pp. 907-915. Summary in Spanish. Author's summary modified.] **3912**

The disease, first recognized in the Sudan in 1912, is the most serious disease in the country, although there has been a considerable regression and three Provinces are completely free.

Control is mainly by large-scale inoculation of Bennett's type of vaccine. In addition there is strict quarantine. Slaughter with payment of compensation has been successfully applied in one district. Attempts are being made to improve the vaccine: special attention is being given to the selection of a suitable culture medium.

Elek, P. & Cottew, G. S. (1961). **Growth of the bovine pleuropneumonia organism Mycoplasma mycoides var. mycoides, in the embryonated hen egg.**—Aust. vet. J. **37,** 163-168. [Authors' summary modified.] **3913**

Strain "V5" was cultivated in chick embryos, and maintained in this medium for over 40 passages. With inocula of 10^7 organisms the mean survival time of the embryo was 4–5 days. Yields of 10^8 organisms per ml. were obtained with 6 to 8–day embryos inoculated by the yolk sac route and incubated at 32·2° or 37°C. Titres were higher with incubation at 37° than at 32·2°C. Yield did not depend on size of inoculum and an inoculum of about 2 organisms was usually sufficient to initiate growth in half the embryos. In eggs harvested on the fifth day those with live embryos yielded viable counts of the same order as those with dead embryos. The incubation of harvested egg contents at 37°C. for 2 days increased the viable count up to tenfold.

Litvinov, N. A. (1960). **[Studies on the causal agent of agalactia-like disease of sheep.]** — Trudy Saratov. zootekh.-vet. Inst. **9,** 273-291. [In Russian.] **3914**

The PPLO isolated from sheep in Saratov [*V.B.* **31,** 3202] differed from the organisms of ovine contagious agalactia and bovine contagious pleuro-pneumonia. It was pleomorphic, but in all forms there was a peripheral cytoplasmic zone that did not take up stains. Electron microscopy revealed elementary bodies. The best medium for isolating the organism was Marten's broth, with horse serum added. The optimum pH for growth was 7·8–8·0. Growth was visible after cultivation of the primary generation for 6–8 days, or 2–3 weeks for subsequent generations. The organism would not grow on solid media. It was pathogenic for rabbits, guinea-pigs and mice.—R.M.

Powelson, D. M. (1961). **Metabolism of animal cells infected with mycoplasma.**—J. Bact. **82,** 288-297. [Author's abst. modified.] **3915**

PPLO altered the amino-acid metabolism of animal cells. Different strains of animal cells showed different responses to one PPLO strain, and different strains caused different responses in one strain of cells. PPLO did not grow in the tissue culture medium (No. 199 plus 2% horse serum and 20 to 40 units of penicillin/ml.) nor in spent culture fluids. They rapidly died at 37°C. but survived for months at 4°C. The altered metabolism of the

infected tissue cultures appeared to reflect a true host-parasite interaction.

Cumming, R. B. (1961). **Preliminary survey of the incidence of avian PPLO (Mycoplasma gallinarum) in an area in Australia.**—Aust. vet. J. **37**, 221-224. [Author's summary modified.] **3916**

A survey of poultry in the Tamworth area of New South Wales using the plate agglutination test revealed that 16 of 17 farms had a high incidence of antibodies to avian pleuropneumonia-like organisms in their flocks. Possibilities of control were discussed.

Adler, H. E., Shifrine, M. & Ortmayer, H. (1961). **Mycoplasma inocuum sp. n., a saprophyte from chickens.**—J. Bact. **82**, 239-240. [Authors' abst. modified.] **3917**

A new species of PPLO was isolated from the infraorbital sinuses of fowls with coryza. The organism was a saprophyte and it differed from all known PPLO of avian origin. It was named *Mycoplasma inocuum.*

Smith, H. Williams & Crabb, W. E. (1961). **The faecal bacterial flora of animals and man: its development in the young.**—J. Path. Bact. **82**, 53-66. [Authors' summary modified.] **3918**

Differential bacterial counts were made on the faeces of calves, lambs, piglets, human babies, and a rabbit at frequent intervals from birth onwards. Throughout the examination period, usually 6–15 months, the bacterial content of the faeces of different animals of the same species and age was closely similar, irrespective of the animal's breed and environment. The variation that occurred with age was often enormous. For example, the total viable count in calves over 7 months of age was often ten thousand times less than that during the first few weeks of life.

The development of the faecal flora during the early weeks of life was similar in all the species studied, but, as the animals grew older, great differences, particularly of a quantitative nature, appeared between the floras of the different species. *E. coli, Cl. welchii* and certain types of streptococci were the first bacteria to be found in large numbers, and they became less numerous as the animals grew older. Lactobacilli and bacteroides were usually a little later in colonizing the intestine, but often persisted in very large numbers for a longer time. Some types of streptococci were also found in the faeces in large numbers over long periods. *Staph. aureus* was never isolated from the faeces of the calves, lambs, piglets and rabbit, but was found at 24 of 58 examinations of the faeces of a human baby.

Differential counts were performed on the faeces of each of 10 adult cattle, sheep, horses, pigs, rabbits, guinea-pigs, mice, dogs, cats, fowls and persons, all 10 animals from each species living in different environments. In general, the results for animals of the same species conformed to a common pattern and this differed markedly from species to species. *Staph. aureus* was found only in human faeces.

See also absts. **4209-4211** (reports, U.K.); **4212-4213** (reports, Nigeria); **4214** (report, Zanzibar); **4215** (book, fungi of India).

DISEASES CAUSED BY PROTOZOAN PARASITES

Nigeria. (1960). **West African Institute for Trypanosomiasis Research. Annual report 1959.** [Willett, K. C.] pp. 54. London : Harrison & Sons Ltd. **3919**

A strain of *Trypanosoma gambiense* that has undergone 968 syringe passages in rats in 8 years is now completely monomorphic, kills rats in 2–3 days, and is no longer pathogenic for monkeys. Of 69 tsetse flies that fed on a pig in which no trypanosomes could be found by routine methods, 5 became infected. The infection of *Glossina palpalis* with *T. gambiense* is not affected by the sex of the fly. *G. palpalis* emerging from pupae incubated at 28°C. were often crippled, and those from pupae kept at 20°C. were not readily infected.

Morphological differences between *T. dimorphon* and *T. congolense* were described. Two strains of *T. dimorphon* were more virulent than 3 strains of *T. congolense* in cattle, sheep and rats. The Vom strain of *T. dimorphon* was of low pathogenicity in a horse. Rises in the serum content of glutamic pyruvic transaminase were found in oxen and sheep with severe parasitaemia. A reedbuck was refractory to *T. vivax*, but the course of infection in a gazelle and a duiker resembled that in sheep; large amounts of β_2-globulin and γ-globulin appeared in the blood of the exposed wild animals. Precipitating antibodies were demonstrated in animals infected with trypanosomes. The periods of protection given by metamidium compounds in cattle and antrycide compounds in pigs were determined.

Metamidium chloride (3 or 6 mg./kg., s/c) suppressed *T. simiae* parasitaemia in pigs and nucleocidin (0·025 mg./kg., i/m) suppressed *T. vivax* parasitaemia in cattle, but all the animals had a relapse. Trypanosomes resistant to several drugs were often of low pathogenicity to the host in which they were maintained.

G. palpalis was eradicated from 1,500 yards of a stream by spraying only broad-leaved bushes and logs with 4% dieldrin emulsion up to a height of 2–3 feet.—M.G.G.

Robson, J. (1961). **Prophylaxis against trypanosomiasis in zebu cattle. II. The duration of prophylaxis conferred by preparations of prothidium compared with antrycide prosalt.**—Vet. Rec. **73**, 641-645. [Author's summary modified.] **3920**

Duration of prophylaxis in zebu bulls or bullocks treated with a single dose of Prothidium bromide (powder or tablets) or Prothidium glucoside was compared with that conferred by Antrycide Prosalt R.F. in an area of heavy trypanosome risk.

Prothidium bromide 4 mg. per kg. gave the longest prophylactic effect; at 2 mg. per kg. it gave less protection. Prothidium glucoside at 4 mg. per kg. and Antrycide at 7·4 mg. per kg. both gave poor protection.

No systemic reactions were noted but a high proportion of rupturing of the site of injection occurred in animals treated with Prothidium.

Twenty untreated bullocks introduced at intervals all became infected in 14 to 34 days and 14 died of trypanosomiasis, the others being treated and removed.

Gray, A. R. (1961). **Soluble antigens of Trypanosoma vivax and of other trypanosomes.**—Immunology **4**, 253-261. [Author's summary modified.] **3921**

Precipitins against trypanosomal antigens occurred in serum from zebu cattle which had been infected for prolonged periods with *T. vivax* transmitted by *Glossina morsitans*. Precipitating antisera against *T. vivax* were used to detect complexes of soluble trypanosomal antigens in sera from rats infected with blood-passaged strains of *vivax, gambiense* and *brucei* and in sera from goats infected with a cyclically transmitted strain of *vivax*. Antisera contained antibodies which reacted with antigens common to the three species of trypanosomes, and also antibodies which reacted with antigens which may be specific to *T. vivax*.

Ormerod, W. E. (1961). **The study of volutin granules in trypanosomes.** — Trans. R. Soc. trop. Med. Hyg. **55**, 313-327. [Author's summary modified.] **3922**

Refractile inclusion bodies in trypanosomes, visible by phase contrast microscopy, were called "volutin granules" if they occurred naturally, and "chemotherapy granules" if they were produced by drugs. The relationship between these granules is considered.

Honigberg, B. M. (1961). **Comparative pathogenicity of Trichomonas vaginalis and Trichomonas gallinae to mice. I. Gross pathology, quantitative evaluation of virulence, and some factors affecting pathogenicity.** — J. Parasit. **47**, 545-571. [Abst. from author's summary.] **3923**

A statistical comparison of the mean volumes of subcutaneous lesions produced in mice by the several strains of both species reveals that these volumes, which express the degree of pathogenicity of the strains to the experimental hosts, faithfully reflect their relative virulence to the natural hosts. The least virulent strains of the human genital trichomonad are more harmful to mice than the least pathogenic strains of the avian species. Both species become attenuated in their virulence when maintained in culture, more so in *Tr. gallinae* than in *Tr. vaginalis*. The presence of agar in the cultures of strains of both trichomonad species and in the inocula enhances the development of subcutaneous lesions.

Nakamura, M. (1961). **Effect of fumagillin in mixed cultures containing Entamoeba histolytica and Trichomonas hominis.**—J. Parasit. **47**, 368. **3924**

Many media for cultivation of *E. histolytica* also allow growth of *Tr. hominis;* elimination of the amoebae to obtain a culture of *Tr. hominis* in such a medium was effected by addition of 10 to 1,000 μg./ml. of fumagillin.—E.V.L.

Hammond, D. M., Clark, W. N. & Miner, M. L. (1961). **Endogenous phase of the life cycle of Eimeria auburnensis in calves.**—J. Parasit. **47**, 591-596. [Abst. from authors' summary.] **3925**

Of 21 young calves inoculated with *E. auburnensis* oocysts, 19 became infected and discharged oocysts for 2 to 7 days, beginning about 18 days after inoculation. The peak number of oocysts usually occurred 19 days after inoculation. Five calves killed 18 to 19

days after inoculation had catarrhal enteritis and eosinophilia. The results indicate that this species is of relatively low pathogenicity.

Microgametocytes, macrogametocytes, and oocysts were found in mesodermal cells in the lamina propria of the villi in the lower small intestine. Early *auburnensis* gametocytes were found in calves killed 15 days after inoculation with *E. bovis* and *E. auburnensis* oocysts, and intermediate stages of gametocytes were seen in calves killed after 16 to 17 days.

McLoughlin, D. K. & Gardiner, J. L. (1961). **Zoalene tolerance by Eimeria tenella.** — J. Parasit. **47**, No. 4 Sect. 2 p. 46. [Abst. from authors' abst.] **3926**

A strain of *E. tenella* not previously exposed to drugs was serially propagated in chickens that initially were fed suboptimal levels of zoalene. During the 12th to 17th passages the birds were fed the chemical at the usual level of 0·0125%. The strain developed tolerance to zoalene. Oocysts of the 17th passage recovered from medicated and unmedicated birds were given to birds fed mash containing nicarbazin, Trithiadol, Unistat, glycarbylamide, arsenosobenzene and nitrofurazone. Only with nitrofurazone was there any indication of cross-resistance by the zoalene-tolerant strain.

Aycardi, J. (1960). I. Activité coccidiostatique d'un complexe sulfate de framycetine menadione bisulphitique. II. Activité coccidiostatique des associations furazolidone-nitrofurazone. [**Coccidiostatic action in fowls of a framycetin-menaphthone complex and of furazolidone combined with nitrofurazone.**] — Ann. Zootech. **9**, 209-215 & 217-221. [Summaries in English.] **3927**

Efficacy of framycetin (100 g. per metric ton of food) against experimental *E. tenella* infection was improved by adding menaphthone sodium bisulphate at 1 g. per metric ton of food. The best concentration of furazolidone and nitrofurazone was 50 p.p.m. of each in the food.—R.M.

Kantor, S. & Kennett, R. L., Jr. (1961). **The activity of chlortetracycline against Eimeria acervulina.**—J. Parasit. **47**, No. 4 Sect. 2 pp. 45-46. [Authors' abst. modified.] **3928**

Chlortetracycline eliminated or greatly reduced lesions in about one-third of the chicks at 440 to 500 p.p.m. in diets containing 0·4 and 0·8% Ca. Lesions were eliminated from almost all the birds given 880 to 1,000 p.p.m. chlortetracycline in a diet containing 0·8% Ca. Poorer results were obtained when the ration contained 1·4% Ca.

Doran, D. J. & Farr, M. M. (1961). **I. Bacteria-free suspensions of Eimeria acervulina sporozoites and the effect of antibiotics on excystation. II. In vitro excystation of Eimeria acervulina.** — J. Parasit. **47**, No. 4 Sect. 2 pp. 34-35 & 45. **3929**

Farr, M. M. & Doran, D. J. (1961). **In vivo excystation of Eimeria acervulina.** — Ibid. p. 45. [Abst. from authors' absts.] **3930**

Bacteria-free suspensions of *E. acervulina* sporozoites were obtained by treating 400,000 to 670,000 oocysts per ml. with a mixture of antibiotics for 4 days, then releasing the sporocysts by aseptic grinding with a mortar and pestle and finally treating with sterile 0·25% trypsin in 5% chicken bile at pH 7·3 to 7·6.

E. acervulina oocysts, sporulated in potassium dichromate and freed from debris by sugar flotation, were inoculated into the crops of chickens 3, 13, and 44 days old. Examination of the birds 10 to 15 min., 25 to 30 min. and 1 hour after inoculation indicated that the oocysts were apparently unchanged in the crop, and a high percentage were broken and their sporocysts released in the gizzard. The sporozoites escaped from the liberated sporocysts in the duodenum and jejunum.

Lotze, J. C. & Leek, R. G. (1961). **A practical method for culturing coccidial oocysts in tap water.** — J. Parasit. **47**, 588-590. [Authors' summary modified.] **3931**

For preparing and sporulating ovine coccidia in large batches, oocyst-bearing material is freed from the larger solid particles through screening and from water-soluble substances by thorough washings, after which it is placed in defined amounts in tap water in shallow dishes.

Al-Dabagh, M. A. (1961). **Eyelid lesions in chicks infected with Plasmodium gallinaceum.** —Trans. R. Soc. trop. Med. Hyg. **55**, 351-354. [Author's conclusions modified.] **3932**

Chicks with severe acute *Pl. gallinaceum* infections may develop eyelid lesions, very similar to those described in pantothenic acid deficiency in chicks.

Al-Dabagh, M. A. (1961). **Symptomatic partial paralysis in chicks infected with Plasmodium juxtanucleare.**—J. comp. Path. **71**, 217-221. [Author's conclusions modified.] **3933**

Partial symptomatic paralysis observed in 10 out of 148 chicks infected with the plasmodium may be due to the severe necrotic and inflammatory lesions observed in the brain and spinal cord.

Kirshnamurti, P. V., Peardon, D. L., Todd, A. C. & McGibbon, W. H. (1961). **A blood parasite from chickens in Wisconsin.** — J. Parasit. **47,** No. 4 Sect. 2 p. 44. [Authors' abst. modified.] **3934**

A parasite was observed inside erythrocytes in a blood smear from a laying pullet. There were between 1 and 3 parasites per 3,000 red blood corpuscles. When blood was transfused to 3-week-old chickens, the initial parasitic forms appeared in erythrocytes in peripheral blood 8 to 12 days later. The parasites multiplied between the 10th and 25th days, and different forms (apparently including trophozoites, schizonts and gametocytes) were observed. The infection has been maintained by passage. The parasite appeared to be a *Plasmodium;* the species has not been established.

Clarkson, M. J. (1961). **The blood supply of the liver of the turkey and the anatomy of the biliary tract with reference to infection with Histomonas meleagridis.** — Res. vet. Sci. **2,** 259-264. [Author's summary modified.] **3935**

The right and left hepatic arteries are derived from different branches of the coeliac artery. The hepatic portal system consists of a large right portal vein from the intestines and spleen and small left portal veins from the gizzard and proventriculus. The right portal vein connects with the renal portal system by the coccygeo-mesenteric and hypogastric veins. The two bile ducts are joined within the substance of the liver.

C. discussed these findings in relation to the pathogenesis of histomoniasis.

Shone, D. K., Wells, G. E. & Waller, F. J. A. (1961). **The activity of amicarbalide against Babesia bigemina.**—Vet. Rec. **73,** 736-739 & 740. [Authors' summary modified.] **3936**

Amicarbalide (3 : 3'-diamidino-carbanilide) administered s/c or i/m at the rate of 10 mg. per kg. had better action against *Babesia bigemina* than phenamidine isethionate. Local tolerance by deep i/m inj. is good and systemic tolerance is also good. Severe local reactions resulted when 50 w/v solution was given by s/c inj.

Shone, D. K. & Philip, J. R. (1960). **The susceptibility of the African bush pig, Potamochoerus porcus maschona, Lonnberg, to infection with Babesia trautmanni.** — J. S. Afr. vet. med. Ass. **31,** 451-453. [Authors' summary modified.] **3937**

The African bush pig could harbour *B. trautmanni* for 16 days, and for a further 8 days after splenectomy. The infection was inapparent. Numerous *Rhipicephalus simus* and one *Rh. appendiculatus* were collected from domestic sows during an outbreak of piroplasmosis.

The incubation period in domestic pigs following s/c inj. of infected blood was 4 to 6 days.

Brocklesby, D. W. & Vidler, B. O. (1961). **Attempts to infect some small laboratory animals with Theileria parva.** — Res. vet. Sci. **2,** 285-287. [Authors' summary modified.] **3938**

Attempts to infect hamsters, rabbits, multimammate rats and unstriped grass mice with *Th. parva* were unsuccessful.

Bray, R. S. & Garnham, P. C. C. (1961). **Failure to infect splenectomized primates with Theileria parva.**—J. Parasit. **47,** 538. **3939**

The protozoan did not become established in two chimpanzees and three monkeys (all splenectomized) after infected *Rhipicephalus appendiculatus* ticks had fed on them.—R.M.

Mandoul, R., Dargelos, R. & Millan, J. (1961). Destruction des protozoaires intestinaux de la souris par un dérivé nitré de l'imidazole. [**Destruction of intestinal protozoa in mice by metronidazole.**] — Bull. Soc. Pat. exot. **54,** 12-16. [Summary in English.] **3940**

The drug cured *Giardia, Trichomonas* and *Entamoeba* infections in mice. It was administered in the drinking water for 11 days at a daily dose of 266 mg./kg. body wt. This dosage was not toxic for mice.—R.M.

Moulton, J. E., Heuschele, W. P. & Sheridan, B. W. (1961). **Balantidiasis in the capybara.** —Cornell Vet. **51,** 350-358. [Authors' summary modified.] **3941**

The clinical and pathogolical features of *Balantidium coli* infection in six capybaras [*Hydrochoerus capybara*] were described. The principal lesion was ulceration of the colon.

See also absts. **4210-4211** (reports, U.K.); **4212-4213** (reports, Nigeria)

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Brown, F., Planterose, D. N. & Stewart, D. L. (1961). **Effect of p-fluorophenylalanine on the multiplication of foot-and-mouth disease virus.**—Nature, Lond. **191,** 414-415. 3942

The yield of F. & M. disease virus and viral ribonucleic acid in pig kidney tissue culture decreased as the concentration of *p*-fluorophenylalanine added to the medium increased. Addition of 1,000 micro-moles, even immediately before the maturation stage, led within 20 min. to complete inhibition of the syntheses of virus and infective nucleic acid. It appears that the synthesis of the infective nucleic acid of F. & M. disease virus is intimately related to the continuous synthesis of protein.—M.G.G.

Schwöbel, W. (1961). Die Bildung von Plaques durch das Virus der Maul- und Klauenseuche unter methylcellulose-haltigen Medien. [**Formation of plaques by the virus of foot and mouth disease under media containing methylcellulose.**]—Z. Naturf. **14b,** 479-480. 3943

Plaque formation is usually observed in infected cell layers covered by agar. Instead of agar, a nutrient medium made viscous by adding methylcellulose could be employed, and this method had certain advantages.—R.M.

I. Mašić, M. (1961). [**Modes of infection of cattle with Aujeszky's disease.**]—Acta vet., Belgrade **11,** 49-54. 3944

II. Mašić, M. & Petrović, M. (1961). [**Failure to transmit Aujeszky's disease by lice.**]—Ibid. 79-84. [In Serbian. Summaries in German.] 3945

I. Young cattle, housed together with rabbits, pigs or cattle which had been experimentally infected with Aujeszky's virus, failed to develop the disease. They resisted intranasal instillation or i/m inj. of a dose of 10^{-3} of virus, but one animal given an i/m dose of 10^{-1} of virus developed the disease. The latent form, as often seen in pigs, does not appear to occur in cattle. Despite the relatively high incidence of the disease in pigs in the Vojvodina district of Yugoslavia, Aujeszky's disease does not appear to constitute a potential danger to the cattle population.

II. The authors failed to infect mice by intracerebral and rabbits by i/m inj. of a suspension prepared from lice (*Haemotopinus suis*), which had fed for 4–6 days on experimentally infected pigs.—E.G.

Hebert, H. J. & Humphrey, G. L. (1961). **Rabies outbreak in Imperial County.**—Publ. Hlth Rep. Wash. **76,** 391-397. 3946

A severe outbreak in the U.S.A. was believed to have spread from local predatory animals; control measures included the setting-up of 188 poison bait stations, destruction of 4,259 stray dogs and vaccination of 29,867 animals.—E.V.L.

Vaughan, J. B. & Gerhardt, P. (1961). **Isolation of Flury rabies vaccine virus from the salivary gland of a cat.**—J. Amer. vet. med. Ass. **139,** 221-223. [Authors' summary modified.] 3947

Rabies virus was isolated from the submaxillary salivary glands of a cat which died following vaccination with low egg passage Flury rabies vaccine. The case history and experiments on dogs, rabbits, hamsters, g.pigs, and chick embryos suggested that the agent isolated was the vaccine strain.

Powell, H. M. & Culbertson, C. G. (1959). **Inactivation of fixed rabies virus, grown on embryonated duck eggs, by means of beta propiolactone.** — Sthwest. Vet. **12,** 281-285. [Authors' summary modified.] 3948

Preparation of pooled batches of duck-embryo fixed rabies virus and its inactivation by beta-propiolactone were described.

Such completely inactivated virus proved to be an effective antirabies vaccine, free from side reactions peculiar to brain vaccine.

Thiéry, G. (1960). Considérations théoriques et pratiques sur un traitement curatif de la rage déclarée. [**Curative treatment of clinical rabies.**]—C.R. Acad. Sci., Paris **252,** 4219-4220. 3949

The author's treatment was based on the theory that a convulsive electric shock liberated rabies virus from nerve cells, so that it could be neutralized by rabies antibodies circulating in the blood. Experiments were done on laboratory animals and on Gambian rats (*Cricetomys gambianus*) infected with street virus. To cure rabies three shocks each producing unconsciousness for 5 min. had to be given daily for 12 days, while simultaneously massive doses of rabies hyperimmune serum were injected.—R.M.

Zebrowski, L., Smith, K. O. & Sharp, D. G. (1961). **Staining of vaccinia-infected L cells**

with brilliant cresyl blue.—J. Immunol. **87,** 228-231. [Authors' summary modified.] **3950**

Although nearly all normal L cells in cultures 3 to 5 days old are stained by brilliant cresyl blue, cells infected with vaccinia virus tend to remain unstained. This tendency may develop 2 hours after infection and it increased to involve most of the cells after 2 or 3 days of incubation.

Sellers, T. F., Jr., Schulman, J., Bouvier, C., McCune, R. & Kilbourne, E. D. (1961). **The influence of influenza virus infection on exogenous staphylococcal and endogenous murine bacterial infection of the bronchopulmonary tissues of mice.** — J. exp. Med. **114,** 237-256. [Authors' summary modified.] **3951**

Mice infected with influenza A virus were less able to destroy or remove staphylococci introduced by the respiratory route. This temporary inhibition of local defence mechanisms lasted 7 to 10 days.

Persistence of staphylococci in the lung following influenza did not appear to alter the nature of the pathological reaction to influenza virus. Presence of influenza virus in the respiratory tract did not alter the fate of intravenously injected staphylococci in the lung or other organs. Half the mice with influenza had purulent bronchopneumonia and infection with *Pasteurella* and *Haemophilus.* Only a few control animals had such infections.

Drescher, J. (1961). **Comparison of the adsorption of influenza virus strain B/Berlin/2/55 on aluminium oxide and on aluminium hydroxide.** — Amer. J. Hyg. **74,** 104-118. [Abst. from author's summary.] **3952**

Aluminium hydroxide was found to adsorb more virus per mol than aluminium oxide did under the same experimental conditions. The adsorption on aluminium oxide was found to be uniform. The adsorption on aluminium hydroxide lacked uniformity; no adsorption isotherm could be established.

I. Casals, J. (1961). **Procedures for identification of arthropod-borne viruses.** — Bull. World Hlth Org. **24,** 723-734. **3953**

II. Porterfield, J. S. (1961). **Cross-neutralization studies with group A arthropod-borne viruses.**—Bull. World Hlth Org. **24,** 735-741. [Summaries in French. Authors' summaries modified.] **3954**

I. Certain steps are advisable in the identification of an arthropod-borne virus. (1) Determination of the arthropod-borne nature of the virus. (2) Determination of the antigenic group. For this are used hyperimmune sera with considerable cross-reactivity within the group. (3) Determination of type within the group, using simple immune sera.

Viruses that belong in minor groups or are ungrouped often constitute a problem because, once the major groups have been eliminated, comparative studies must be conducted with practically all the remaining viruses before a definitive answer is reached.

II. The plaque-inhibition test was applied to 15 group A strains. Middelburg and Eastern equine encephalomyelitis viruses show no relationship to any other virus in the group. Sindbis and Western equine encephalomyelitis viruses show a one-way relationship only. The remaining viruses all share some antigenic components which react with hyperimmune rabbit sera prepared against Semliki Forest virus. By using single-dose rabbit sera, or more specific mouse-immune sera, four distinct subgroups can be defined. One includes Semliki Forest virus strains; another Chikungunya virus and its substrains, Vereeniging and TH 35 viruses; the third contains O'nyong-nyong virus; and the fourth Mayaro and Uruma viruses. The plaque-inhibition technique can also be used for the rapid identification of new virus isolates.

Lowenthal, J. P., Berman, S. & Grogan, E. W. (1961). **Eastern equine encephalomyelitis vaccine prepared in cell cultures.** — Science **134,** 565-566. [Authors' abst. modified.] **3955**

Protection tests in g.pigs indicate that vaccines prepared from virus propagated in chick embryo cell cultures are as effective as the purified whole chick-embryo vaccines which are currently used for human immunization against Eastern equine encephalomyelitis.

Littlejohns, I. R., Harris, A. N. A. & Harding, W. B. (1961). **Sporadic bovine encephalomyelitis.**—Aust. vet. J. **37,** 53. **3956**

A report is made of a disease, recognized in New South Wales for over 30 years, which is similar to or identical with sporadic bovine encephalomyelitis. It has been described as an "ephemeral fever-like disease" [*V.B.* **16,** 439] and more recently as a transmissible serositis. Points of difference between the conditions are listed.—A. G. Culey.

Kniazeff, A. J., Huck, R. A., Jarrett, W. F. H., Pritchard, W. R., Ramsey, F. K., Schipper, I. A., Stober, M. & Liess, B. (1961). **Anti-**

genic relationship of some bovine viral diarrhoea-mucosal disease viruses from the United States, Great Britain, and West Germany.—Vet. Rec. **73**, 768-769. 3957

This is a short paper by joint authors from the U.S.A., Great Britain and Federal Germany, on preliminary serum neutralization studies to establish the antigenic relationship between agents of the virus diarrhoea-mucosal disease group, isolated in the countries stated. An antigenic relationship was found between virus diarrhoea Oregon (C24V) virus and the following viruses of the group: New York (NY-1), Iowa (Saunders), North Dakota (BMD), Indiana (MD-1), England (LS), Scotland (GPB) and West Germany (Lamspringe-60).—E.G.

Trapp, A. L. (1960). **Pathology of the blood-vascular and lymphatic systems of cattle affected with mucosal disease.**—Dissertation, Iowa pp. 157. [Abst. from Diss. Abstr. **21**, 2252 (1961).] 3958

T. studied the cardiovascular and haematopoietic systems of 64 cattle with mucosal disease, and also the haematology of 50 cases.

In lymph nodes there was severe depletion in the number of small lymphocytes and a reduction in the number of mitotic figures observed. Occasionally there was severe coagulative necrosis in the cortex of the mesenteric lymph nodes. Lesions were always severe in the mesenteric lymph nodes, and also (in order of decreasing severity) in suprapharyngeal, bronchial, prescapular, parotid and prefemoral nodes. The same type of lesions was present in spleen and haemal nodes. In spleen there were also increases in haemosiderin, neutrophiles and eosinophiles in the periphery of the lymphatic nodules.

The main alteration in tonsils and thymus was a decrease in the number of thymocytes or small lymphocytes. An apparent increase in the number of Hassall's corpuscles was also observed in the thymus. Lesions in Peyer's patches ranged from depletion of lymphocytes to coagulative and liquefactive necrosis of the lymphatic tissue. Lesions attributable to mucosal disease were not observed in sections of the cardiovascular system.

In the later stages of the disease there were increases in erythrocyte count, haemoglobin concentration, haematocrit value, blood urea nitrogen level, blood sugar, and a decrease in total blood volume.

In most cases total leucocyte counts were normal or elevated but in a few cases a leucopenia was noted. Differential leucocyte counts revealed lymphopenia and neutrophilia. An apparent myeloid hyperplasia of the bone marrow with a predominance of neutrophile cells was observed in many animals.

Zuschek, F. & Chow, T. L. (1961). **Immunogenicity of 2 infectious bovine rhinotracheitis vaccines.**—J. Amer. vet. med. Ass. **139**, 236-237. [Authors' summary.] 3959

Two types of vaccine for infectious bovine rhinotracheitis, a tissue culture-modified live-virus vaccine and a formalin-killed-virus vaccine, produced sufficient immunity in cattle to protect against subsequent challenge with virulent live virus.

Bögel, K. (1961). Virologische Untersuchungsbefunde bei Kälbern mit respiratorischem Syndrom unter besonderer Berücksichtigung der Parainfluenza-3-Virusinfektion. [**Virological research in calves with respiratory syndrome, with special reference to infection with para-influenza 3 myxovirus.**] — Mh. Tierheilk. **13**, 129-135 & 162-174. 3960

A strain of para-influenza 3 isolated from the noses of three sick calves produced respiratory disease histologically similar to virus pneumonia in a calf aged 4½ weeks; the virus was recovered from the lung tissue. Mild tracheobronchitis was also produced experimentally by the strain in 6 calves about 5 months old.—E.V.L.

Ketler, A., Hamparian, V. V. & Hilleman, M. R. (1961). **Laboratory and field investigations of bovine myxovirus parainfluenza 3 virus and vaccine. I. Properties of the SF-4 (shipping fever) strain of virus.** — J. Immunol. **87**, 126-133. 3961

McClelland, L., Hampil, B., Hamparian, V. V., Potash, L., Ketler, A. & Hilleman, M. R. (1961). **Laboratory and field investigations of bovine myxovirus parainfluenza 3 virus and vaccine. II. Development and appraisal of potency of SF-4 (shipping fever) virus vaccine.**—Ibid. 134-138. 3962

Hamparian, V. V., Washko, F. V., Ketler, A. & Hilleman, M. R. (1961). **Laboratory and field investigations of bovine myxovirus parainfluenza 3 virus and vaccine. III. Evaluation of an SF-4 (shipping fever) virus vaccine in cattle.**—Ibid. 139-146. 3963

The authors discussed the possible role of para-influenza 3 virus in "shipping fever". They developed a formaldehyde-killed virus vaccine using the SF-4 strain of the virus

propagated in cell cultures of bovine kidney. Such vaccine when incorporated into an emulsified mineral-oil adjuvant proved highly potent for stimulating antibody response in cattle.

Efficacy of the vaccine was evaluated in terms of antibody response in cattle and with regard to prevention of experimental infection with the virus. Evidence was presented to indicate spread, under field conditions, of para-influenza 3 virus infections without clinically recognizable illness.—R.M.

McFerran, J. B. (1961). **Some properties of a bovine enterovirus.**—Res. vet. Sci. **2,** 185-192. [Author's summary modified.] **3964**

A virus isolated from the faeces of a normal calf and designated VG(5)27 was antigenically similar to the LC R4 virus isolated in the U.S.A. by Kunin & Minuse (1958). The virus measured approximately 23 mμ, and was relatively thermostable. It was not inactivated by ether or by the chloroxylenol type of disinfectant, but was rapidly inactivated by disinfectants containing chlorine, and by formalin. It was not susceptible to variations in pH. It did not cause lesions or death in laboratory animals.

Ross, C. A. C. (1961). **Louping-ill in the West of Scotland.**—Lancet, September 2nd pp. 527-528. [Author's summary modified.] **3965**

Sera from 408 patients in the west of Scotland suffering from either aseptic meningitis, encephalitis, or meningoencephalitis, or from "paralytic poliomyelitis", during 1959–60 were examined for louping-ill antibodies by complement fixation using a mouse brain antigen. Only one patient, a sheep farmer with meningoencephalitis, showed evidence of louping-ill infection. During the period of study, louping-ill was a serious disease of sheep in part of this area. Thus it appears that in Scotland natural infection of man with involvement of the central nervous system is rare.

Kumagai, T., Shimizu, T. Ikeda, S. & Matumoto, M. (1961). **A new in vitro method (END) for detection and measurement of hog cholera virus and its antibody by means of effect of HC virus on Newcastle disease virus in swine tissue culture. I. Establishment of standard procedure.**—J. Immunol. **87,** 245-256. **3966**

Matumoto, M., Kumagai, T., Shimizu, T. & Ikeda, S. (1961). **A new in vitro method (END) for detection and measurement of hog cholera virus and its antibody by means of effect of HC virus on Newcastle disease virus in swine tissue culture. II. Some characteristics of END method.**—Ibid. 257-268. [Authors' summaries modified.] **3967**

I. This method is based on the findings that, under certain experimental conditions, Newcastle disease virus exerts no cytopathic effect when inoculated into swine testicular cell monolayer cultures within 4 or 5 days of cultivation, whereas Newcastle disease virus produces cytopathic changes when inoculated into the same culture after 6 to 8 days of cultivation, and that in cell cultures infected in the initial stage of cultivation with swine fever virus (which is not cytopathic) Newcastle disease virus readily produces marked cytopathic effects even if it is inoculated as early as the second, third, or fourth day of cell cultivation. Various factors involved in the phenomenon were investigated and a standard method of procedure was established.

II. The method was successfully employed for titrating swine fever virus with highly reproducible results. The sensitivity of the method appeared to be somewhat lower than the ordinary swine inoculation method, but this disadvantage was overcome by an intermediary passage of the viral material to be tested in swine spleen culture. All the laboratory strains of virus so far tested were capable of producing this phenomenon, except the Lederle live vaccine strain, whereas various swine materials not containing the virus invariably failed to produce the phenomenon. The method appeared to be as effective as swine inoculation for detecting swine fever virus in naturally infected pigs. It was also applied to the detection and measurement of neutralizing antibodies. The mechanism of the phenomenon was discussed and it was concluded that this was an example of virus exaltation.

Hecke, F. (1961). Untersuchungen über die Vermehrung des Virus der ansteckenden Schweinelähmung (Teschener Krankheit) im Verdauungstrakt. **[Proliferation of the virus of Teschen disease n the digestive tract of pigs.]**—Zbl. Bakt. I. (Orig.) **182,** 142-158. [Summaries in English, French, Spanish and Russian.] **3968**

In pigs fed culture of Teschen disease virus, viral titres of over 10^{-5} were found in the faeces. Excretion of the virus lasted for at least 5 weeks and was accompanied by the

development of serological titres. The virus appears to grow mainly within the epithelium of the colon. The degree of proliferation seems to have no pathogenic significance.
—M.G.G.

Betts, A. O., Kelly, D. F., Lamont, P. H. & Sheffy, B. E. (1961). **The isolation and characterisation of some enteroviruses from pigs.** — Vet. Rec. **73,** 752-754 & 755. [Authors' summary modified.] **3969**

It is suggested that the following 4 criteria should be fulfilled before a virus is termed a porcine enterovirus. It should be: (1) small (30 to 40 mμ); (2) resistant to ether; (3) capable of multiplying in the alimentary tract of the pig; (4) cytopathic for porcine kidney tissue cultures. The authors isolated a number of cytopathic agents from faeces of pigs. Some of these, together with the viruses of Teschen and Talfan diseases and the T80, T52A, F52 and V13 viruses, satisfied the 4 criteria and were divided into at least 9 groups by cross-neutralization tests in tissue cultures.

Bittle, J. L., York, C. J. & Newberne, J. W. (1961). **Adaptation and modification of a strain of canine distemper virus in tissue culture.**—Cornell Vet. **51,** 359-369. [Authors' summary modified.] **3970**

A virulent strain of canine distemper virus was adapted to canine kidney tissue culture. The time required for this virus to produce cytopathic changes was gradually reduced from 18 days in the initial isolation to 9 days by the 21st passage, after which no further reduction occurred. Cytoplasmic inclusions were demonstrated in stained preparations well before a cytopathic effect became evident. The virus was also modified from the virulent to a practically avirulent form; with 20th and 21st tissue culture passage material it produced an antibody response but no clinical signs of disease in inoculated dogs and did not spread to contact controls.

Ablett, R. E., Baker, L. A. & Holmes, J. W. H. (1961). **Isolation of the canine hepatitis virus from a sucking puppy.**—Vet. Rec. **73,** 616-617 & 618. **3971**

A bitch with a serum neutralization titre of 1 : 1,280 to canine hepatitis virus gave birth to 8 puppies, 4 of which died within 3 days. The virus was isolated from a suspension of liver, kidney and mesenteric lymph node tissues from one of the dead puppies. The filtered suspension was injected i/p into 4 dogs, 2 of which had been immunized against virus hepatitis. These 2 remained normal, the third died in 5 days with numerous nuclear inclusions in the liver and kidney, and the fourth, destroyed on the 12th day, had a high titre to the virus, and focal interstitial nephritis.—M.G.G.

White, G., Simpson, R. M. & Scott, G. R. (1961). **An antigenic relationship between the viruses of bovine rinderpest and canine distemper.** — Immunology **4,** 203-205. [Authors' summary modified.] **3972**

A close but not complete antigenic relationship between the viruses of rinderpest and distemper was illustrated by gel-diffusion techniques.

Carmichael, L. E. & Barnes, F. D. (1961). **Serological comparisons between infectious canine hepatitis virus and human adenovirus types.** — Proc. Soc. exp. Biol. N.Y. **107,** 214-218. [Authors' summary modified.] **3973**

Antigenic relationships between infectious canine hepatitis virus (CH) and certain human adenoviruses were confirmed by complement-fixation, indirect haemagglutination and gel-diffusion precipitin tests. The serological relationship was unilateral, since antisera against human adenoviruses react in various tests with CH antigen, while specific antisera to CH failed to react with group-reactive human adenovirus antigens (types 2 and 4). There was no specific cross-neutralization between CH and the adenovirus types examined. Certain biological properties shared by the canine and the human adenoviruses were compared, and these suggest that CH should be included taxonomically within the adenovirus group.

Wemmenhove, R. & Jansen, J. (1961). De incubatietijd der myxomatosis. **[The incubation period of myxomatosis.]**—Tijdschr. Diergeneesk. **86,** 1183-1191. [In Dutch Summaries in English, French, German and Spanish. Abst. from English summary.] **3974**

The virus described in this paper had a period of incubation between 7 and 10 days but in most cases it was 9 days. Rabbits placed in infected boxes did not contract the disease, except when they were in contact with diseased rabbits. The authors were successful in reproducing the disease by puncturing the skin of a rabbit with a thin infected needle (imitating the bite of an insect).

Kraft, L. M. (1961). **Responses of the mouse to the virus of epidemic diarrhea of infant mice. Neutralizing autibodies and carrier state.**—Proc. Anim. Care Panel **11,** 125-136. [Author's abst. modified.] **3975**

The sera of mice having had one contact with epidemic diarrhoea virus were incapable of neutralizing significant amounts of the virus. Sera from mice having lifelong contact with the agent were more apt to neutralize the virus. Adults can be intestinal carriers for at least 17 days after a single exposure to the virus. Litters of previously infected primiparae are almost as susceptible to the agent as are litters of normal dams.

Bauer, D. J. & Sadler, P. W. (1961). **Derivatives of isatin beta-thiosemicarbazone with anti-viral chemotherapeutic activity against ectromelia infection.**—Nature, Lond. **190,** 1167-1169. **3976**

Isatin-β-thiosemicarbazone has anti-viral activity in mice infected intracerebrally with vaccinia, but not in mice infected with ectromelia; suggesting that the compound acts against the virus rather than against the host cell. Modification of the molecule has given derivatives with high activity against ectromelia and little or none against vaccinia. These compounds are all $4^1:4^1$- dialkylthiosemicarbazones of isatin with N-methylisatin or N-ethylisatin; further modifications may lead to activity against other viruses.—E.V.L.

Soave, O. A. & van Allen, A. (1958). **Lymphocytic choriomeningitis in a mouse breeding colony**—Proc. Anim. Care Panel **8,** 135-140. [Authors' summary modified.] **3977**

The symptoms, pathology, epidemiology and control of lymphocytic choriomeningitis are discussed. An outbreak in a mouse breeding colony is reported and some of the implications of latent viral infections for experimental pathology are outlined.

McLean, D. M., Walker, S. J., MacPherson, L. W., Scholten, T. H., Ronald, K., Wyllie, J. C. & McQueen, E. J. (1961). **Powassan virus: investigations of possible natural cycles of infection.**—J. infect. Dis. **109,** 19-23. [Authors' summary.] **3978**

During 1959 and 1960 neutralizing antibody to Powassan virus was detected in serums from 5 of 23 chipmunks and 2 of 14 squirrels captured near Powassan, Ontario. No antibody was detected in 17 snowshoe hares despite heavy infestation with the tick *Haemaphysalis leporis palustris.*

On Manitoulin Island during 1960, neutralizing antibody to Powassan virus was detected in serums from 5 of 178 snowshoe hares, 2 of 16 chipmunks, and 2 of 45 squirrels, suggesting that all these species may be reservoirs of virus. No vector of Powassan virus between wildlife and man has been incriminated as yet. Isolation of previously unrecognised viruses from 2 pools of *H. leporis palustris* removed from 4 hares suggests that this species may be a vector in natural cycles of infection with these viruses in ticks and snowshoe hares.

Halstead, S. B. & Buescher, E. L. (1961). **Hemorrhagic disease in rodents infected with virus associated with Thai hemorrhagic fever.**—Science **134,** 475-476. [Authors' abst. modified.] **3979**

A virus recovered from a child with Thailand haemorrhagic fever produces in infant mouse, rat, and hamster a disease that is characterized by spontaneous bleeding at multiple sites, notably in the gastro-intestinal tract, and by severe abnormalities in haemostatic mechanisms. This virus differs in this respect from Chikungunya virus to which it is immunologically similar and from other Thai haemorrhagic fever viruses.

Johnston, P. B. (1961). **A second immunologic type of simian foamy virus: monkey throat infections and unmasking by both types.**—J. infect. Dis. **109,** 1-9. [Author's summary modified.] **3980**

Fourteen strains of a new group of simian foamy virus were isolated from Taiwan and Philippine monkeys and designated type 2. These and the original type 1 strains were frequently recovered from kidneys and throat swabs of apparently healthy monkeys. Thirty-eight out of 104 throats were positive, including 24 type 1 strains and 12 type 2. Usually virus could not be recovered by inoculating rabbit kidney monolayer cultures with kidney suspension, but by "unmasking" of kidney cultures 26 strains were recovered from 47 monkeys.

Bankowski, R. A. (1961). **A study of asymptomatic Newcastle disease in a breeding flock.**—Res. vet. Sci. **2,** 193-201. [Author's summary.] **3981**

An asymptomatic form of Newcastle disease which was diagnosed by chance by means of the haemagglutination inhibition test is described. No evidence of transmission of the virus was found following contact

exposure of susceptible chickens for as long as 179 days to asymptomatic but infected birds. Newcastle disease virus could not be isolated from serologically reacting chickens, from embryos of eggs laid by the hens, or from the progeny of the breeding flock.

Gale, C., McCartney, M. G. & Sanger, V. L. (1961). **Newcastle disease in turkeys.** — J. Amer. vet. med. Ass. **139,** 462-465. [Authors' summary modified] 3982

Newcastle disease virus was isolated from a flock of 1,048 turkey hens. The only signs of disease were mild respiratory disorders. There was a big fall in egg production and most of the eggs were soft-shelled, misshapen and lacked pigment.

Neuronal degeneration was found in the cerebrum, brain stem, and cerebellum. Respiratory lesions were extensive. Affected birds had HI titres to N.D.

Reuss, U. (1961). Die Empfänglichkeit der Haustauben für die atypische Geflügelpest. **[Susceptibility of pigeons to Newcastle disease.]**—Mh. Tierheilk. **13,** 153-162. 3983

The author investigated the susceptibility of pigeons to both experimental and natural contact infection with Newcastle disease. Oral infection of pigeons with doses fatal to fowls rarely produced clinical disease, whereas i/m and i/v infection was usually fatal. These birds excreted the virus and could thus infect fowls. Pigeons kept in contact with fowls in natural conditions were resistant to infection and it was concluded that pigeons do not spread the disease from infected flocks. —E.V.L.

I. Read, J. (1961). **The control of Newcastle disease in Great Britain.**—Brit. vet. J. **117,** 275-288. 3984

II. Hoekstra, J. (1961). **Control of Newcastle disease and infectious bronchitis by vaccination.**—Ibid. 289-295. [Authors' summaries modified.] 3985

I. An historical survey of Newcastle disease in Gt. Britain since its first recognition by Doyle in 1926 is given. As a result of recent trends in the expansion of the broiler industry the control of the disease has presented considerable difficulty in certain areas, notably East Anglia, and the slaughter policy is at present under review by a Committee of Inquiry.

II. An attempt to eradicate Newcastle disease in the Netherlands by official control methods failed. The paper describes the subsequent policy adopted, in which a live virus vaccine (Hitchner B_1 strain) is administered in the drinking water. Provided the vaccine was applied at three-monthly intervals, excellent protection was obtained.

One infectious bronchitis vaccine is prepared from a Dutch field strain of the virus attenuated by some 50 egg passages. Its use is restricted to fowls aged 3–4 months. For young chicks and for laying fowls a milder vaccine produced by further repeated egg passages of the same strain is used.

A combined Newcastle disease/infectious bronchitis vaccine was as effective as either vaccine given separately, but the combination is not entirely free from hazard and the advantages and disadvantages of a combined vaccine are discussed.

Mansjoer, M. (1961). **Newcastle disease in Indonesia. Part I. Its present situation, epizootiology and combat.**—Commun. vet., Bogor **5,** 1-15. 3986

Ressang, A. A. (1961). **Newcastle disease in Indonesia. Part II. Its symptomatology, gross and microscopic anatomy.**—Ibid. 16-37. [In English. Summary in Indonesian.] 3987

I. Newcastle disease was first recorded in Indonesia in 1926. Economic losses inflicted by the disease are considerable. Mortality is between 30–40%. Human infection has been observed. Dissemination in poultry by air-borne virus, food, faeces, immunized or subclinically infected birds, wild animals, human beings, etc., was discussed. Satisfactory results were obtained with a whole-egg vaccine of virus passaged in wild doves (*Geophelia striata striata*). The use of live vaccines by unskilled persons is forbidden. Import restrictions on poultry and use of killed vaccines for juvenile birds were advocated. Pilot poultry disease control schemes in every veterinary district were recommended.

II. In Indonesia, as in Europe, the character of Newcastle disease is mainly enteritic as compared with the pneumo-encephalitic nature of the disease in North America. Inflammatory lesions were seldom present in nerve tissue: the main lesions included vascular congestion, degenerative changes in neurones and occasional cerebral haemorrhages, necrosis or perivascular cuffing. Laryngo-pharyngitis, intestinal necrosis and proventricular haemorrhages were considered

of greater diagnostic value than examination of the c.n.s.—E.G.

Wachendörfer, G. (1961). Die Präzipitation im Agargel zur Identifizierung des Newcastle-Virus, nebst Versuchen zur Abgrenzung des Hitchner B_1-Virus von velogenen Newcastle-Stämmen. **[The gel diffusion test for Newcastle disease and attempts to differentiate between strains of low and high virulence.]** —Dtsch. tierärztl. Wschr. **68,** 382-384. [Summary in English.] **3988**

In the gel diffusion test, precipitins were demonstrated in the blood of fowls naturally infected with Newcastle disease or hyper-immunized i/m with live avirulent virus (Hitchner B_1 strain), but not in fowls given adsorbed vaccine nor in chicks given the avirulent virus in the drinking water. The test did not distinguish between strains of high and low virulence.—M.G.G.

Petek, M. & Quaglio, G. (1960). Virus Fahey-Crawley e virus A37020 di Sumner e Coll.: studio comparativo sperimentale di due virus neurotropi aviari. **[Comparative study of two neurotropic viruses of fowls.]**—Atti Soc. ital. Sci. vet. **14,** 598-604. [Summaries in English and German.] **3989**

The virus isolated from chronic respiratory disease by Fahey & Crawley [*V.B.* **24,** 2367] was compared with egg-adapted avian encephalomyelitis virus isolated by Sumner & colleagues [*V.B.* **28,** 2877]. The first produced nervous symptoms in 46% of infected day-old chicks and 20% died, whereas the second produced nervous symptoms in 73% and 46% died. Both viruses were resistant to ether, chloroform and heat, and there was some cross-immunity in neutralization tests. —R.M.

Carnaghan, R. B. A. (1961). **Egg transmission of infectious synovitis.**—J.comp. Path. **71,** 279-285. [Author's conclusions.] **3990**

An account is given of an outbreak of infectious synovitis in laying pullets and the subsequent isolation of the infective agent from 6 per cent of embryos and a single chick hatched from an egg produced by the clinically normal survivors of the disease.

The disease was successfully transmitted to adult fowls in the laboratory and the causal agent was isolated from embryos dying during incubation and from chicks hatched from eggs produced by the survivors of the experimental disease.

Jansen, J. (1961). **Duck plague.**—Brit. vet. J. **117,** 349-356. [Author's summary modified.] **3991**

A historical survey is given of the highly fatal, peracute disease in ducks, which was first observed in the Netherlands, in 1923. The epidemiology, symptoms and P.M. findings are described in detail. Experimental work quoted has shown that the virus is quite distinct from the viruses of Newcastle disease, fowl plague or duckling hepatitis. Two strains of the virus are described, the 'O' (old) strain from earlier outbreaks and the 'W' (Wageningen) strain from recent outbreaks.

Baron, S. & Isaacs, A. (1961). **Mechanism of recovery from viral infection in the chick embryo.**—Nature, Lond. **191,** 97-98. **3992**

Production of antibody and delayed hypersensitivity do not occur in chick embryos of any age, whereas the interferon mechanism begins to function in the embryo at about 8 days and increases thereafter. Using groups of chick embryos aged 4, 7, 10 and 13 days and vaccinia, Chikungunya or influenza viruses, the authors found that between the 7th and 10th days there was rapid development of sensitivity to the antiviral action of interferon and an equally rapid increase in the ability to recover from viral infections. The work suggests that interferon alone may be an essential factor in recovery from many viral infections.—E.V.L.

Hillis, W. D. (1961). **An outbreak of infectious hepatitis among chimpanzee handlers at a United States Air Force base.**—Amer. J. Hyg. **73,** 316-328. **3993**

The author describes an unusually high incidence of infectious hepatitis amongst personnel at the Holloman Air Force base in New Mexico. Of 35 veterinary staff who came into intimate contact with newly-imported chimpanzees, 11 contracted infectious hepatitis and so did 11 of 21 other persons in contact with the animals. The local incidence of this disease amongst the resident population is under 2 a 1,000 and the assumption is made that the chimpanzees acted as natural hosts. Many persons handling chimpanzees suffered from bites and scratches and transmission may have occurred this way. The incubation period between first contact with the chimpanzees and the appearance of clinical symptoms was from 4 to 6 weeks, which corresponds with the known incubation period of infectious hepatitis (2 to 6 weeks). Because no virus has so far been isolated from

human infectious hepatitis there are obvious difficulties in confirming the conclusions reached. Experimental work hitherto has failed to give convincing evidence that Primates including chimpanzees are susceptible to infectious hepatitis of human origin. —R. N. FIENNES.

Dudgeon, J. (1961). **Modern aids to diagnosis of virus diseases.**—Brit. med. J. May 6th, 1269-1276. 3994

A discussion of methods employed in human virology.—R.M.

Powell, H. M., Walcher, D. N. & Mast, C. (1961). **Inhibition of cytopathic action of Salisbury virus by antiviral agent 1758.**—Proc. Soc. exp. Biol. N.Y. **107,** 55-57. [Authors' summary.] 3995

It has been found that an antiviral agent called 1758, and somewhat similar to agent 8450 in antiviral action in mice, exhibits demonstrable inhibition of the cytopathic action of Salisbury virus, Strain H.G.P. This antiviral agent is of penicillium origin, and Strain H.G.P. is one of several strains reported of common cold origin.

Dane, D. S., Dick, G. W. A., Briggs, M., Nelson, R., McAlister, J., Connolly, J. H., McKeown, F. & Field, C. M. B. (1961). **Vaccination against poliomyelitis with live virus vaccines. 8. Changes in Sabin type I oral vaccine virus after multiplication in the intestinal tract.**—Brit. med. J. July 29th, 269-271. [Authors' summary modified.] 3996

Eleven children were fed Sabin type I vaccine virus. During the following month three other children in contact with them became infected with the virus. The faecal and throat viruses excreted by the children produced paralysis and histological lesions in a proportion of the monkeys inoculated.

Matheka, H.-D. & Wittmann, G. (1961). Das Entsalzen von Virus-Suspensionen durch Gel-Filration. **[Removal of salts from virus suspensions by gel filtration.]**—Zbl. Bakt. I. (Orig.) **182,** 169-178. [Summaries in English, French, Spanish and Russian.] 3997

Pigeon pox virus and viruses of F. & M., Teschen, and Newcastle diseases were removed from salt solns. by filtration through a column of dextran gel. No loss of virus was observed. This method is quicker than dialysis in cellophane membranes.—M.G.G.

Stoenner, H. G., Lackman, D. B., Benson, W. W., Mather, J., Casey, M. & Harvey, K. A. (1961). **The role of dairy cattle in the epidemiology of Q fever in Idaho.**—J. infect. Dis. **109,** 90-97. [Authors' summary modified.] 3998

The incidence of Q fever antibodies and of disabling febrile illnesses lasting 2 days or longer among families associated with 119 infected dairy herds was compared with findings among families associated with 141 Q fever-free herds. Twenty-six per cent of 333 persons in the former group were serologically positive, compared with only 14% of 394 persons in the latter group. Although dairy cattle were a source of human infection, a significant amount of clinical illness was not associated with this infection.

See also abstr. **4209-4211** (reports, U.K.); **4212-4213** (reports, Nigeria); **4214** (report, Zanzibar).

IMMUNITY

DeLong, R. (1961). **Use of agar diffusion and fluorescent antibody.**—Nature, Lond. **190,** 1126-1127. 3999

In the agar diffusion technique for analysis of antigenic materials there is difficulty in discerning the precipitation zones. By using fluorescent antibody, the precipitation zones viewed or photographed in the near ultra-violet range appear much clearer than with non-fluorescent antibody.—E.V.L.

Parks, J. J., Leibowitz, M. I. & Maumenee, A. E. (1961). **The effect of route of inoculation upon development of antibody in rabbits.**—J. Immunol. **87,** 199-204. [Authors' summary modified.] 4000

Comparable titres of specific circulating antibodies were induced following inoculation of identical quantities of soluble antigen either into the cornea or the vitreous humour. These titres were comparable with those induced when the same quantity of antigen is incorporated in adjuvant and injected i/m. These three methods of antibody induction have in common two basic mechanisms: slow diffusion of antigen from the site of inoculation, and the infiltration of the inoculation site with cells involved in the production of anti-

body. The use of avascular ocular routes in experimental immunization is suggested if antigen is scarce or if the use of an adjuvant is not desired.

Biggs, P. M. & Payne, L. N. (1961). **Pathological changes following the inoculation of chick embryos with adult cells. I. Spleen cells. II. Blood cells.**—Immunology **4,** 24-37 & 38-48. **4001**

I. Inoculation of 15-day-old chick embryos with adult cock spleen cells caused extensive proliferation of reticulum cell foci, primitive cells and granulocytes. These changes resulted in a rapid enlargement of the spleen and to a lesser extent of the liver. This phase which lasted 7 days was followed by lymphoid transformation of the reticulum cell foci and a gradual return to normal structure in both spleen and liver. Pathological changes were not observed in livers and spleens of chick embryos treated with adult rabbit spleen cells, bovine serum albumin, or Hanks' saline.

II. Three consecutive histological stages were observed after inoculation of adult fowl blood; the first 2 closely resembled those following injection of adult spleen cells and the 3rd stage was characterized by a depletion of lymphoid tissue in the liver and spleen and associated with the terminal phases of runt disease.

Bishop, D. W. (1961). **Aspermatogenesis induced by testicular antigen uncombined with adjuvant.**—Proc. Soc. exp. Biol., N.Y. **107,** 116-120. [Author's summary modified.] **4002**

Adult g.pigs produced no spermatozoa after repeated intracutaneous inj. of homologous testicular homogenate without adjuvant, and after injection of testicular antigen and complete adjuvant in separate sites on the same side of the neck. With testicular tissue alone, severe germinal lesions were induced after 100 days in animals injected 3 or 6 times weekly with 0·1 or 0·05 ml. respectively. Degree of germinal damage resulting from separate-site injection of uncombined antigen and adjuvant was comparable to that when testis is incorporated into complete liquid paraffin adjuvants before administration. Results of separate-site injections suggest dependency on a common lymphatic drainage system.

Raettig, H. & Wölk, B. (1961). Provokation einer Infektion durch Schutzimpfung. VI. Mitteilung. Leukocytenwerte nach subcutaner Immunisierung der Maus. **[Provocation of infection by immunization. VI. Leucocyte count after subcutaneous immunization of mice.]**—Zbl. Bakt. I. (Orig.) **182,** 294-317. [Summaries in English, French, Spanish and Russian.] **4003**

There was a decrease in the leucocyte count in the blood of mice immunized s/c with different bacterial vaccines or poliomyelitis vaccine. The minimum count was between 5 and 12 hours after injection. Only the lymphocytes participated in the decrease; the number of granulocytes usually increased. It was suggested that the lymphopenia was a transitory weakness in the defence system of the body.—M.G.G.

Metzgar, R. S. & Grace, J. T., Jr. (1961). **Agar precipitation reactions between human serum albumin and hemoglobin in human tissue extracts.** — J. Immunol. **86,** 578-583. [Authors' summary modified.] **4004**

Normal human and animal sera gave agar precipitation reactions with certain human tissue extracts.

The serum component reacting with the human tissue extracts had an electrophoretic mobility corresponding to albumin. The constituent in the human tissue extracts which interacted with albumin had an electrophoretic mobility corresponding to that of an α-2 globulin and appeared to be haemoglobin or a haemoglobin product. The precipitate formed was soluble in haemoglobin excess and its density was dependent upon the albumin concentration. The agar precipitation reactions were not demonstrable by other serological techniques. A cautious interpretation of immunological reactions in an agar medium was advised.

See also abts. **3826** (staphylococci); **3844-3846** (TB.); **3854** (B.C.G.); **3863** (c.f. test in melioidosis); **3864** (swine erysipelas); **3865** (listeriosis); **3874** (maternal transfer of anti-salmonella agglutinins in hedgehogs); **3875-3876** (salmonellosis); **3878-3883** (brucellosis); **3886** (leptospiral vaccine for control of bovine abortion); **3891** (vibriosis); **3893** (anaerobic diseases); **3897** (botulism); **3904** (trichophyton); **3921** (trypanosomiasis); **3954** (influenza); **3955** (E.E.E vaccine); **3959** (bovine rhinotracheitis vaccine); **3961-3963** (bovine myxovirus para-influenza); **3980** (simian foamy virus); **3985** (control of Newcastle disease and infectious bronchitis by vaccination); **4024, 4037, 4042, 4047 & 4049** (helminths).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Macleod, J. & Donelly, J. (1961). **Failure to reduce an isolated blowfly population by the sterile males method.** — Ent. exp. appl. **4,** 101-118. [Authors' abst. modified.] **4005**

In 1956 and 1957 pupae of *Lucilia sericata* were irradiated at 6,000–7,000 rep, and allowed to emerge at three points on Holy Island. The sterilized population was maintained in preponderant numbers by regular replenishments. A test in 1958 showed no reduction in the density of the species. Possible causes of failure of the method are examined, and it is concluded that either the sterilization was inadequate or that the sterilized males were unable to compete with the native males.

Anderson, J. L. & Catley, A. (1961). **Screw worm in New Guinea.**—Aust. vet. J. **37**, 201. **4006**

Fly strike attributed to *Chrysomyia micropogon* and *C. megacephala* on horses and cattle in Papua and New Guinea was recorded in 1946. *C. bezziana* was identified in 1952 (recorded 1954) from flies reared from larvae infesting wounds on cattle from Rabaul, and more recently from cattle in the Port Moresby area. To prevent the spread of *Chrysomyia* spp. all vessels carrying livestock to Australia are treated with insecticide before leaving the Territory.—A. Culey.

Drummond, R. O. (1961). **A new organophosphorus systemic insecticide for the control of larvae of Oestrus ovis L. in sheep.**—J. Parasit. **47**, No. 4 Sect. 2 p. 36. [Author's abst. modified.] **4007**

Single oral drenches of Bayer 37342 [*O, O*-dimethyl *O*- (3, 5-dimethyl-4-methylthiophenyl) phosphorothioate] at doses of 50 and 100 mg. per kg. were completely effective in ridding sheep of all three larval instars of *Oestrus ovis*. At 25 mg. per kg. the compound was not completely effective. Single treatments of 50 and 100 mg. per kg. in the feed were also completely effective, but i/m inj. of 25 and 50 mg. per kg. were less effective. Most bots were expelled but a few were found dead in the nostrils or in blind sinuses. None of the sheep exhibited symptoms of phosphorus insecticide poisoning.

Rich, G. B. & Ireland, H. R. (1961). **An appraisal of Ruelene and Trolene against cattle grub infestations, (Oestridae: Diptera).**—Canad. J. Anim. Sci. **41**, 115-119. [Authors' abst. modified.] **4008**

Ruelene i/m inj. at 5 and 10 mg./kg. and fenchlorphos (Trolene) boluses at 105 mg./kg. reduced the numbers of warbles by 83, 86 and 86%, respectively: these reductions were not significantly different. Intramuscular injections did not cause detectable lesions at the injection site in 90 calves. The injection method was preferred to the bolus method for ease of administration, economy of labour, and decreased danger of injury to animals. Feeding Ruelene at 5 mg./kg. and 10 mg./kg. daily for 5 days, and feeding fenchlorphos at 15 mg./kg. daily for 7 and 12 days, reduced the numbers of warbles by 95, 94, 94 and 97% respectively.

Bauch, R. J. (1961). Probleme der biologischen Insektizidprüfung I. Freiland-Versuchstechnik zur innertherapeutischen Dasselfliegenbekämpfung. **[Problems of biological testing of insecticides. I. Field technique of internal therapy for ox warbles.]**—Angew. Parasit. **2**, 1-6. [Summaries in English and Russian.] **4009**

Conditions for successful control of ox warbles by internal therapy are:— determination of the infested area; preliminary trials of the toxicity of the drug in small animals such as chicks; temporary housing of the cattle for ease of treatment and subsequent observation for symptoms of toxicity, otherwise high doses should not be given; examination of the cattle once a month from January to July, with external treatment of infested animals.—M.G.G.

Andersen, E. H. (1961). **Systemic insecticides for control of tropical warble fly (Dermatobia hominis) in cattle.**—J. Amer. vet. med. Ass. **139**, 104-107. **4010**

Two isolated groups of Costa Rican cattle infested with *D. hominis* were treated either intramuscularly with dimethoate (Am. Cyanamid 12880, rogor) at the rate of 10 mg./kg., or by spraying with 1 or 2% trichlorphon (Neguvon). The cattle were treated 4 times at intervals of about 30 days (those dosed with dimethoate were also sprayed with BHC against ticks and adult *D. hominis*). Larval counts in both herds fell to 5–15% of the pre-treatment levels, and were less than those of some untreated cattle (although these had been treated with an unspecified insecticide and no original larval counts were included for these animals).

—W. N. Beesley.

Andreev, K. P. & Zakamyrdin, I. A. (1961). **[Hexamethylenebenzamide (hexamid B) as a repellent of tabanid flies on cattle.]**—Veterinariya, Moscow No. 6 pp. 68-69. **4011**

Zakamyrdin, I. A. (1961). **[Protection of livestock from blood-sucking diptera with the aid**

of polychlorpinene.] — Ibid. pp. 70-73. [In Russian.] **4012**

Cattle were protected from flies by spraying them with 1 or 2% emulsion of hexamid B, or a mixture of 2% hexamid B and 3% polychlorpinene, or a 2–3% emulsion of polychlorpinene alone. Protection lasted 2–3 days.—R.M.

Granett, P. & Hansens, E. J. (1961). **Tests against face flies on cattle in New Jersey during 1960.**—J. econ. Ent. **54,** 562-566. **4013**

No really effective residual treatment against face flies (*Musca autumnalis*) was found, although up to 2 oz. of sprays or smears were applied to the heads of cattle. Protection for a few hours followed the use of synergized pyrethrins plus repellents (butoxypolypropylene glycol and "MGK R1207", *i.e.*, 3-chloropropyl *n*-octyl sulphoxide). A 1 : 10 mixture of methoxychlor : butoxypolypropylene glycol and 0·2–0·5% Dibrom were also effective for about 6–8 hours. Dibrom tends to produce slight skin irritation to both cattle and operators. Other insecticides tested, including coumaphos (Co-Ral), Diazinon, rogor (dimethoate), and DDVP, were of little value either alone or in sugar bait smears. The more effective insecticides produced a generally beneficial effect on horn fly and stable fly attacks.

—W. N. Beesley.

Bateman, N. (1961). **Simultaneous eradication of three ectoparasitic species from a colony of laboratory mice.** — Nature, Lond. **191,** 721-722. **4014**

The mouse mange mites *Myocoptes musculinus, Myobia musculi* and *Psorergates simplex,* and the blood-sucking louse *Polyplax serrata,* were completely eradicated from a colony of laboratory mice by dipping in a soln. of 67 g. of "Tetmosol" [monosulfiram, B.Vet.C.], 2 g. of "D.M.C." [di-(*p*-chlorophenyl) methylcarbinol] in 3 g. of ethanol, to which one litre of warm water had been added.—E.G.

Sinclair, A. N. (1961). **Field trials with the jetting technique for applying insecticides to control itch mite (Psorergates ovis) of sheep.** —Aust. vet. J. **37,** 211-216. **4015**

"Jetting" was less effective than dipping as a method of applying insecticides to sheep for the control of itch mite. On a Queensland property sheep were examined periodically over 3 years. On some of these sheep the mite population declined each summer; others remained free from infestation although in contact with infested sheep. S. considers that shearing in midsummer influenced the behaviour of the mite population and favoured the insecticidal treatments.

—N. P. H. Graham.

Harrison, I. R. & Marshall, P. G. (1961). **The depletion of insecticides in sheep-dipping baths: further field trials.**—J. Sci. Fd Agric. **12,** 548-552. [Authors' abst. modified.] **4016**

In experiments on the depletion of aldrin, dieldrin and γ-BHC from dipping baths, replenishment procedures were varied in an endeavour to maintain a more uniform dip throughout a trial. A study was made of the change in physical behaviour of the dip with the passage of large numbers of sheep and of the eventual stabilization of insecticide concentration. A reason for this stabilization of concentration was suggested.

Emby, G. N. & Gallagher, P. J. (1961). **Factors affecting losses of benzene hexachloride in dipwash samples.**—J. S. Afr. vet. med. Ass. **32,** 71-74. [Authors' summary modified.] **4017**

Bacterial decomposition, initiated in dipping tanks, is a factor to be considered when dip-wash samples containing BHC are in transit for analyses. It is essential that these samples reach the laboratory as soon as possible following sampling, in order that the analytical results reflect the actual concentration of BHC in the tank at the time of sampling. As_2O_3 (0·16%) when added to dip-wash samples inhibits bacterial decomposition effectively. Such a material could be added to samples when delays in analyses are anticipated.

Polythene plastic absorbs BHC: it is recommended that polythene bottles should not be used to hold dip-wash samples or other dilutions containing BHC.

Smith, J. (1961). **Demodicidosis in large domestic animals—a review.** pp. 56. Ottawa: Health of Animals Division, Canada Department of Agriculture. **4018**

This is a very useful and comprehensive review of demodectic infection of cattle, goats, sheep, pigs and horses. For each host there are notes on the morphology, life cycle, habitat, geographical distribution, incidence, transmission, pathogenesis, symptoms, pathology, treatment and control. More detail might have been supplied on the use of the newer acaricides and a table of contents

would have increased the value of the book. A very handy source book, with several recent Russian references among the 100-odd cited. —W. N. BEESLEY.

See also absts. **3919** (report, West African Institute for Trypanosomiasis Research); **3945** (failure of lice to transmit Aujeszky's disease); **4210** (report, U.K.).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Varachiu, N., Pascu, T., Ionescu, A. & Nistor, T. (1960). Cercetări asupra determinării bilirubinemiei în afecţiunile hepatice de natură parazitară la oi. **[Bilirubinaemia in parasitic diseases of the liver in sheep.]** — Lucr. Inst. Agron. Bucureşti Ser. C, No. 4 pp. 193-197. [In Roumanian. Summaries in French and Russian.] **4019**

In 43 healthy sheep the average direct bilirubin content per ml. serum was 0·13 mg.% and the average total content 0·40 mg.%. In 79 sheep with either echinococcus, fasciola or dicrocoelium in the liver, direct values were increased and indirect values reduced, depending on the degree of infestation, although the total bilirubin content per ml. serum remained within the physiological limits.—E.G.

Malek, E. A., Ash, L. R., Lee, H. F. & Little, M. D. (1961). **Heterobilharzia infection in the dog and other mammals in Louisiana.**— J. Parasit. **47**, 619-623. [Authors' summary modified.] **4020**

Heterobilharzia americana was common in raccoons and nutria and was present in all of three dogs examined. One of the dogs died. The authors claimed that this was the first record of canine schistosomiasis in the Western Hemisphere. In all four host species, the worms were located in the veins of both small and large intestines and in the intrahepatic portal veins. Eggs were abundant in the wall of the intestines, and granulomata containing eggs were conspicuous in all parts of the liver. In the dog, eggs were also found in the lungs, kidneys and spleen.

I. Froyd, G. (1961). **The artificial infection of calves with oncospheres of Taenia saginata.** —Res. vet. Sci. **2**, 243-247. **4021**

II. Silverman, P. H. & Hulland, T. J. (1961). **Histological observations on bovine cysticercosis.**—Res. vet. Sci. **2**, 248-252. [Authors' summaries modified.] **4022**

I. Subcutaneous injection of hatched oncospheres into calves did not appear to influence their susceptibility to infection by natural means, or by artificial oral dosing with *Taenia* eggs. Cysts did not migrate from the primary site of parenteral infection.

II. The rate of growth of *C. bovis* in calves was highly variable during the first month after infection. The host reaction is an acute inflammatory response, becoming chronic after 2 months. The breakdown and degeneration of the cyst are described.

Polyanskaya, M. V. (1961). **[Moniezia infestation in reindeer calves.]** — Veterinariya, Moscow No. 7 pp. 46-47. [In Russian.] **4023**

The peak of infestation occurred in July and August, when nearly all reindeer calves examined were found to be infested, compared with 27–38% of those aged 18 months, and 13–15% of adults. Species found were *M. bæri, expansa* and *benedeni*. The number of tapeworms in calves ranged from a few to 62. Heavy infestation caused unthriftiness and emaciation, sometimes fatal.—R.M.

Heyneman, D. (1961). **Studies on helminth immunity. III. Experimental verification of autoinfection from cysticercoids of Hymenolepis nana in the white mouse.** — J. infect. Dis. **109**, 10-18. **4024**

Many *Hymenolepis nana* developed in mice after feeding of 1–30 cysticercoids recovered from grain beetles *Tribolium confusum*. Coprophagy was prevented. A tissue phase occurred in mice fed ova and it was accompanied by formation of immunity to subsequent infestation. This was not observed in mice fed cysticercoids and it appeared that the lack of this resistance was responsible for auto-infection. The relationship of human to murine strains of the tapeworm was discussed with a view to the possible accidental ingestion by man of grain beetles contaminated from mouse faeces. —E.G.

Shah, H. L. & Pandit, C. N. (1959). **A survey of helminth parasites of domesticated animals in Madhya Pradesh. Part I.**—J. vet. Res., Mhow **4**, 1-10. **4025**

Animals examined included horse, cattle, buffalo, sheep, goat, camel, pig, dog, cat, tiger, fowl. Results are tabulated.—R.M.

Nadakal, A. M. (1961). **Frequency and seasonal fluctuations of infections of sheep with certain helminth parasites in Northern India.**—J. Parasit. **47**, No. 4 Sect. 2 p. 57. [Abst. from author's abst.] **4026**

During three years 261 slaughtered sheep were examined. Paramphistomes were found in 5%; species of *Bunostomum* and *Oesophagostomum* in 50%; *Haemonchus* in 80%; tapeworms of the genera *Stilesia, Moniezia,* and *Avitellina* in 80, 50, and 30% respectively. Multiple infections were much more frequent than single ones. Very few worms were found in young sheep.

Immature tapeworms were encountered during August and September and again in February and March there was the incidence of young worms. The periods of fresh infections seem to be correlated with rains and the subsequent appearance of vectors like the oribatid mites on grasses.

Phillipson, R. F. & Kershaw, W. E. (1961). **The production, deposition and growth of the larvae of Trichinella spiralis, and their significance in the chemotherapy of the infection. II. Production and deposition of larvae.** — Ann. trop. Med. Parasit. **55,** 231-234. [Authors' summary modified.] **4027**

Trichinella larvae were recovered by maceration and by digestion of the muscles of mice which had been infected with known numbers of infective larvae. The numbers recovered by the two methods were counted. No larvae were recovered before the sixth day after infection; most were deposited between the 6th and 12th days, and only a few were deposited later. They remain in the blood for a very short time. By analogy with the infection in man, most of the larvae are deposited in the muscles before the onset of symptoms.

Drudge, J. H. & Elam, G. (1961). **Preliminary observations on the resistance of horse strongyles to phenothiazine.**—J. Parasit. **47,** No. 4 Sect. 2 pp. 38-39. **4028**

Drudge, J. H., Wyant, Z. N. & Elam, G. (1961). **Observations on the efficacy of three phenothiazine preparations on a phenothiazine-resistant strain of Haemonchus contortus.**—Ibid. p. 39. **4029**

I. Phenothiazine failed to alter strongyle egg counts in Thoroughbred horses on three farms. On each farm only full therapeutic doses had been given in recent years. Piperazine alone or combined with phenothiazine eliminated nearly all strongyle eggs from the faeces.

II. There appeared to be no difference in action between three preparations having average particle sizes of 8·2, 10·8 and 17 μ when given to lambs harbouring a resistant strain of *H. contortus.*—R.M.

Drudge, J. H., Wyant, Z. N., Elam, G. & Rothenberger, G. (1961). **Synergistic action between phenothiazine and piperazine-carbon disulfide complex against horse strongyles.**—J. Parasit. **47,** No. 4 Sect. 2 p. 40. **4030**

A single administration by stomach tube of phenothiazine (1·25 or 2·5 g./cwt. body wt.) mixed with piperazine-carbon disulphide complex (Parvex, 4 g./cwt. body wt.) removed nearly all strongyles. The mixture was more effective against the larger species than either component used alone.—R.M.

Cuckler, A. C. (1961). **Thiabendazole, a new broad spectrum anthelmintic.**—J. Parasit. **47,** No. 4 Sect. 2 pp. 36-37. **4031**

Campbell, W. C. (1961). **Effect of thiabendazole upon infections of Trichinella spiralis in mice, and upon certain other helminthiases.** —Ibid. p. 37. **4032**

Egerton, J. R. (1961). **The effect of thiabendazole upon Ascaris and Stephanurus infections.**—Ibid. p. 37. **4033**

Alicata, J. E. (1961). **On the ineffectiveness of thiabendazole against the migrating larval stages of the swine kidney worm (Stephanurus dentatus) in rabbits.**—Ibid. p. 38. **4034**

Drudge, J. H. & Elam, G. (1961). **Comparison of thiabendazole, ruelene and phenothiazine for anthelmintic activity in sheep.**—Ibid. pp. 39-40. **4035**

Bailey, W. S., Diamond, D. L. & Walker, D. F. (1961). **Observations on the use of thiabendazole in sheep and cattle.** — Ibid. pp. 40-41. **4036**

Thiabendazole is 2 (4'-thiazolyl)-benzimidazole. It is active against many nematodes and some tapeworms. A safe and effective dosage for sheep and cattle was 55 mg./kg. body wt.—R.M.

Dow, C., Jarrett, W. F. H., Jennings, F. W., McIntyre, W. I. M. & Mulligan, W. (1961). **Studies on immunity to Uncinaria stenocephala infection in the dog—double vaccination with irradiated larvae.**—Amer. J. vet. Res. **22,** 352-354. [Authors' summary modified.] **4037**

To immunize pups against infection with *Uncinaria stenocephala,* a vaccine composed of irradiated infective larvae was used. A high degree of resistance to challenge followed treatment with 2 doses of this vaccine.

Rawes, D. A. & Clapham, P. A. (1961). **A new anthelmintic thenium (N: N-dimethyl-**

N-2-phenoxyethyl-N-2'-thenylammonium) p-chlorobenzene sulphonate: its activity against hookworms and roundworms in the dog. — Vet. Rec. **73**, 755-758. [Authors' summary modified.] **4038**

Thenium p-chlorobenzene sulphonate was very highly active against *Ancylostoma caninum* and *Uncinaria stenocephala* in the dog but less active against *Toxocara canis*. A dose of 200 to 250 mg. morning and evening was the minimum effective dose for the young puppy, and it was not necessary to increase this dose for older, heavier animals. No side effects, except a low incidence of vomition, were observed.

Zimmermann, W. J. & Hubbard, E. D. (1961). **Gastrointestinal parasitism in Iowa cattle.**— J. Amer. vet. med. Ass. **139**, 555-559. [Authors' summary modified.] **4039**

Faeces were collected at intervals of 2 months from 19 herds (1,750 cattle) during 1955–1958. There were trichostrongyle-type eggs in more than half of the samples, ranging from 14·5% in dairy calf faeces to 80% in beef calf samples.

Only 14 of 1,582 samples examined contained more than 300 eggs per gram; 13 of these were from a single herd. No seasonal fluctuation was noticed. *Nematodirus* and *Eimeria* were predominantly parasites of calves, whereas *Moniezia* eggs were found in low numbers in all age groups. *Strongyloides*. *Capillaria, Trichuris*, and *Ascaris* eggs were found only occasionally.

Bremner, K. C. (1961). **A study of pathogenetic factors in experimental bovine oesophagostomosis. I. An assessment of the importance of anorexia.** — Aust. J. agric. Res. **12**, 498-512. [Author's summary modified.] **4040**

Using pair-fed calves, one of each pair was infected with 700 *Oesophagostomum radiatum* larvae. Mild to moderately severe disease of fairly short duration resulted, the first signs being seen at 3–5 weeks. There was improvement from the 10th week and gradual recovery from the 14th week after infection. When anorexia developed in infected calves the same reduction in food intake was imposed upon the controls by withholding part of the ration.

Infected calves on the same feed intake as controls showed a much greater departure from normal in respect of rate of gain in weight, and their growth was more severely retarded. The mean feed utilization of these calves was 0·039 lb. per pound of feed, as compared with 0·095 lb. for the controls. Diarrhoea, normochromic normocytic anaemia, and hypoproteinaemia were most severe when the helminths were in the early fifth stage of development.

It is concluded that anorexia is a factor which, through reduction of food intake, contributed considerably to pathogenesis. Other factors together exercised an effect almost as great.

Mayhew, R. L. & Lank, R. B. (1961). **Studies on bovine gastrointestinal parasites. XXIV. Results of some phenothiazine, copper sulphate and nicotine sulphate experiments.**— J. Parasit. **47**, 637-640. [Authors' summary modified.] **4041**

Four naturally infected heifers were treated with 10 g. of phenothiazine per 100 lb. body wt., followed by copper sulphate, then by copper sulphate plus nicotine sulphate. The parasites present were *Cooperia punctata*, *Bunostomum phlebotomum*, *Nematodirus spp.*, and *Oesophagostomum radiatum*. The eggs of *Oe. radiatum* were eliminated by the daily feeding of 1·5 g. of phenothiazine. Eggs of the other species were not affected by the treatment.

One animal experimentally infected with *C. punctata* was treated with phenothiazine at 10, 18, 30, 50, and 70 g. per 100 lb. body wt. Reductions in the egg count levels occurred following each treatment (except the lowest dose) but in each instance the numbers gradually increased to the former counts.

Two animals with pure infection of *Oe. radiatum* were treated with 10 g. of phenothiazine per 100 lb. body wt. The egg count became zero two days afterwards and remained so for 38 and 71 days, respectively. One animal then produced eggs at 4% and the other at 17% of the former level.

Allen, R. W. & Samson, K. S. (1961). **Preliminary report on the immunization of sheep with a relatively non-pathogenic strain of Haemonchus from pronghorn antelope.**—J. Parasit. **47**, No. 4 Sect. 2 p. 22. [Authors' abst. modified.] **4042**

Six lambs received 10,000 infective larvae of a strain of Haemonchus that had been isolated from a pronghorn antelope in February 1958 and passed through domestic lambs 11 times. Another six received 10,000 larvae of a sheep strain.

At 63 days after inoculation, 4 lambs in each group were challenged with 15,000 larvae

of the sheep strain; 4 controls were also infected. As compared with the controls lambs inoculated initially with the antelope strain were significantly resistant to challenge with the sheep strain. This resistance was not as great as in sheep immunized with the sheep strain.

Vujić, B., Petrović, Z. & Petrović, K. (1961). Neka pitanja epizootiologije nematodiroze na našim terenima. **[Epidemiology of Nematodirus infestation in sheep in Yugoslavia.]**—Vet. Glasn. **15,** 497-503. [In Croat. Summary in German.] **4043**

In a mountainous area highest incidence of infestation in lambs with larvae of *Nematodirus filicollis* and *N. spathiger* was during April and May, although pastures were contaminated with larvae all the year round. Under laboratory conditions larvae resisted repeated drying periods of up to two days and after eight months of such treatment a certain proportion of them still survived. Female worms collected during May carried 55–60 eggs, those collected in December only about 20.—E.G.

Wood, I. B., Emro, J. E. & Waletzky, E. (1961). **The anthelmintic effect of a sulfamoylphenyl phosphorothioate on the gastrointestinal nematodes of ruminants.** — J. Parasit. **47,** No. 4 Sect. 2 p. 36. [Authors' abst. modified.] **4044**

The *O, O*-dimethyl-*O*-*p*-(dimethylsulphamoyl) phenyl ester of phosphorothiotic acid [American Cyanamid 38,023] was active against many of the economically important parasites of sheep. Single oral doses of 60 mg. per kg. nearly completely eliminated adult worms of *H. contortus* and of *Cooperia* spp.; 80 mg. per kg. gave the same control of *Ostertagia* spp., *T. axei* and *T. colubriformis*, but *Nematodirus* spp. were much less susceptible.

In sheep, this compound was relatively safe orally at 400 mg. per kg. with temporary partial anorexia of 2 or 3 days' duration; 800 mg. per kg. was lethal. No signs of toxicity were observed with oral doses of 200 mg. per kg. or less.

Kingsbury, P. A. (1961). **Organo-phosphorus esters and phenothiazine acting synergistically as anthelmintics.**—Res. vet. Sci. **2,** 265-271. [Author's summary modified.] **4045**

Combinations of phenothiazine with coumaphos or with its phosphoroate analogue, Coroxon, acted synergically when employed as anthelmintics against some nematode parasites. Worm counts made after the slaughter of 155 dosed lambs and appropriate controls indicated that 200 mg./kg. of phenothiazine plus 2–2·5 mg./kg. of coumaphos or 200 mg./kg. of phenothiazine plus 1·5–2 mg./kg. of Coroxon had removed the following :— 84–99% of intestinal *Trichostrongylus* spp.; 70–98% of *Strongyloides papillosus;* 98–100% of *Haemonchus contortus;* 79–99% of *Trichostrongylus axei;* and 33–99% of *Ostertagia* spp.

Limited data also suggested high efficiency against *Cooperia* spp. and *Nematodirus* spp. *Trichuris ovis* and *Moniezia expansa* resisted treatment.

Timmerman, J. A., Jr., Turner, H. F. & Arthur, B. W. (1961). **Anthelmintic activity and metabolism of ruelene administered to sheep.**—J. Parasit. **47,** No. 4 Sect. 2 p. 38. [Authors' abst. modified.] **4046**

Ruelene labelled with radiophosphorus and administered orally to sheep was rapidly absorbed, metabolized and eliminated, chiefly in the urine as water-soluble degradation products. By 24 hours after treatment of sheep with 50 mg. per kg., half of the administered drug was eliminated in the urine and 4% in the faeces. Eight metabolites were isolated from the urine and four of these were identified. Five and possibly six metabolites were isolated from several genera of helminths taken from the digestive tract of sheep killed 6 and 24 hours after treatment.

Ruelene formulated as a polymer was less readily absorbed, and less was deposited in the tissues, while a larger percentage was eliminated in the faeces. The polymer constituents also prevented the Ruelene from leaching from faeces placed under natural weathering conditions for 20 days.

Three formulations of Ruelene (wettable powder, liquid drench, Ruelene plus Polymer) were quite effective against species of *Haemonchus, Trichostrongylus, Ostertagia,* and *Trichuris.* Ruelene was not effective against *Nematodirus, Moniezia* or *Oestrus ovis.*

Engelbrecht, H. J. (1961). **An experiment demonstrating the safety and potency of X-irradiated Dictyocaulus viviparus larvae vaccine in calves.**—J. Parasit. **47,** No. 4 Sect. 2 p. 21. [Author's abst. modified.] **4047**

Calves 6 to 8 weeks old were treated as follows. Ten given 1,000 irradiated larvae (40,000 r) were killed from 42 hours to 29

days after vaccination. No gross lesions attributable to the vaccination were noted. One larva was found in one calf. Five controls were given 1,000 non-irradiated larvae. Seven were given two doses of 1,000 irradiated larvae (40,000 r) with an interval of 30 days between doses. They were killed at intervals ranging from 2 to 29 days after the second dose. No gross lesions attributable to the vaccination were noted; lungworms were found in one calf. Five calves given two doses of irradiated larvae were challenged with 4,000 non-irradiated larvae. Very few gross lesions were noted; an average of 3·8 lungworms per calf was found in the lungs 31 days after challenge. Three untreated controls were also challenged, and extensive pneumonic lesions were noted 31 days after challenge. An average of 636 lungworms per calf was found in the controls.

Rose, J. H. (1961). **Three lungworms recently recorded from British sheep.**—Res. vet. Sci. **2,** 253-258. [Author's summary.] **4048**

Cystocaulus ocreatus, Neostrongylus linearis and *Protostrongylus brevispiculum,* three lungworms recently recorded from British sheep, are briefly described. Illustrations are provided to facilitate the identification of these three species.

Jovanović, M., Nevenić, V., Sokolić, A., Sofrenović, D., Gligorijević, J., Čuperlović, K. & Movsesijan, M. (1961). Vakcinacija ovaca zračenim larvama Dictyocaulus filaria. I. Uticaj doze ozračavanja na razviće i patogenost parazita. **[Vaccination of sheep with irradiated Dictyocaulus filaria larvae. I. Influence of dose of irradiation on pathogenicity of the parasite.]** — Vet. Glasn. **15,** 455-464. [In Croat. Summary in English.] **4049**

The optimal effective inactivating dose of X-ray or gamma-ray exposure for third stage larvae of *D. filaria,* intended as vaccine, was between 40,000 and 60,000 r. About 0·2% of larvae irradiated with X-rays reached the adult stage, compared with only about 0·025% of those irradiated with gamma-rays, when equivalent doses of both types of irradiation were used. Over a period of 55 days, about 26% of non-irradiated and only 2·2% of irradiated larvae reached sexual maturity. The sex-ratio of females over males in non-irradiated larvae was 1·62 : 1, in irradiated larvae 11·5 : 1.—E.G.

Alibasoglu, M., Kradel, D. C. & Dunne, H. W. (1961). **Cerebral nematodiasis in Pennsylvania deer (Odocoileus virgineanus).** — Cornell Vet. **51,** 431-441. [Authors' summary modified.] **4050**

In a survey of 81 deer heads for *Elaphostrongylus tenuis* 75% were infested. Histologically a chronic, non-purulent, eosinophilic, verminous meningitis involving principally the dura mater was found. These parasites may therefore cause nervous disorders in deer.

Gazzinelli, G., Guia, M. M., Neves, A. G. A., Pudles, J., Beraldo, W. T. & Dias da Silva, W. (1961). **Purification of the toxic fractions from Ascaris lumbricoides and their effect on the guinea pig.** — Nature, Lond. **190,** 813-814. **4051**

An extract of *A. lumbricoides* was obtained by the method described by Rocha e Silva & Graña (1946). This fraction was purified further by precipitation with ammonium sulphate and alcohol, dialysis against distilled water, and passage through a column of hydroxyapatite. Chemical analysis of the 2 fractions revealed a complex substance containing sugars and protein. An anaphylactic-like reaction developed in g.pigs injected i/v with the fractions. The purified fraction released histamine from isolated g.pig lung, and evoked strong contraction in g.pig ileum.—M.G.G.

Buryabash, F. N. (1961). **[Losses in meat production associated with helminth infestations in cattle, sheep and pigs.]** — Veterinariya, Moscow No. 4 pp. 71-72. [In Russian.] **4052**

In the Stalinsk district, in the years 1957–59, meat inspection revealed helminth infestations in 20·5% of 888,541 cattle, 15% of 537,406 sheep, and 6% of 1,626,510 pigs. —M.G.G.

Fried, K. & Jantošovič, J. (1961). Poznatky o diagnostike askaridiozy hydiny röntgenom. **[X-ray diagnosis of ascaridia infestation in fowls.]** — Veterinářství **11,** 298-300. [In Slovak.] **4053**

Using a barium contrast medium, it was possible to demonstrate radiologically adult ascaridia in the intestine of 25 fowls. This method was unsuitable for the demonstration of larval forms and it failed to show the extent of infestation. Its value as a diagnostic aid, supplementing faecal and clin. examination, was discussed.—E.G.

Knežík, J. & Hovorka, J. (1961). Rozbor výskytu helmintov domácej hydiny v ČSSR a preventívnych metód boja s nimi v podmienkach vel'kochovu. **[Helminth parasites in fowls in Czechoslovakia and their control.]** — Veterinářství **11,** 294-298. [In Slovak.] **4054**

Data on the incidence of helminth parasites, gathered from 2,090 P.M. examinations of fowls, turkeys, geese and ducks were given and methods of control of the more common parasites were discussed.—E.G.

Rothstein, N., Kinnamon, K. E., Brown, M. L. & Carithers, R. W. (1961). **Canine microfilariasis in Eastern United States.** — J. Parasit. **47,** 661-665. **4055**

This gives details of a survey that have already been reported in brief [*V.B.* **31,** 1877].—R.M.

Ponomarenko, V. A. (1961). **[Control of leeches of the genus Protoclepsis in the respiratory passages of ducks.]**—Veterinariya, Moscow No. 7 pp. 56-57. [In Russian.] **4056**

Leeches (*P. tesselata* and *P. maculosa*) killed 170 of 1,800 ducks within two days in July. Death was due to asphyxia from leeches in the nasal passages and trachea. 95% of ducks aged 1–2 months each had up to 19 leeches in the nasal passages and conjunctiva; their growth was retarded and some died. Leeches were killed by immersing the duck's beak, until the nostrils were covered, in 4–10% lactic acid soln. for 3–5 seconds. —R.M.

See also absts. **4210-4211** (reports, U.K.).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Magnusson, G. (1961). Primärtumoren im Herzen des Rindes. **[Primary cardiac tumours in cattle.]**—Dtsch. tierärztl. Wschr. **68,** 405-409. [Summary in English.] **4057**

A description, with 5 illustrations, of 42 cases of cardiac tumours in cattle, consisting of 23 fibromas, 11 neurinomas, 5 fibrosarcomas and 3 neurofibromas.—E.V.L.

Vlăduţiu, O., Murgu, I. & Blidaru, T. (1960). Contribuţii la studiul şi tratamentul tumorilor veneriene la căţea şi pisică. **[Venereal tumours and their treatment in dogs and cats.]**—Lucr. Inst. Agron. Bucureşti Ser. C, No. 4 pp. 269-286. [In Roumanian. Summaries in French and Russian.] **4058**

Details were given of transplantable venereal tumours, mainly lymphosarcoma, in 461 bitches and a number of cats, affecting mainly the external genital organs. Infection by subcutaneous transplantation of tumorous tissue rendered animals immune to subsequent infection. Total removal of the tumour was the best treatment.—E.G.

Rosenberg, J. C., Assimacoupoulos, C., Lober, P., Rosenberg, S. A. & Zimmermann, B. (1961). **The malignant melanoma of hamsters. I. Pathologic characteristics of a transplanted melanotic and amelanotic tumor.**— Cancer Res. **21,** 627-631. **4059**

The neoplasm reported by J. G. Fortner [*Cancer* **10,** 1153 (1957) and *Cancer Res.* **18,** 98 (1958)] was investigated. Part II of this paper, dealing with tissue culture of the melanoma, appears on pages 632–635 of *Cancer Research*.—R.M.

Monlux, W. S. (1961). **Blood vessel hamartias in the chicken.** — Iowa St. Univ. Vet. **23,** 125-126. **4060**

Cannibalism in chickens is often initiated by the presence of bleeding hamartias (haemangiomas) in the skin. These defects of blood vessels are very common in chickens, and are a heritable disease of White Leghorns. Their presence is recognized by blood-soiled feathers, fatal cutaneous haemorrhage, or cannibalism. Occasionally, hamartias (haemangiomas) are found in the internal organs, notably the liver. Fatal haemorrhage is the most common result of the hepatic lesions.—M.G.G.

Crispens, C. G., Jr. (1961). **Chemical carcinogenesis in birds. A review.**—Poult. Sci. **40,** 745-761. [Author's summary modified.] **4061**

The literature on neoplasms in birds is both extensive and controversial. In this paper an attempt has been made to review that portion concerning the chemically induced avian tumours and their transmissibility. A section dealing with much of the recent literature on the Rous sarcoma is included.

Anon. (1960). **Report of a symposium on the provision of animals for cancer research held at the Royal Society of Medicine on 23rd May, 1960.** pp. 116. Carshalton: Laboratory

Animals Centre. 12s. 6d. [Collected papers Vol. 9.] 4062

Among the 14 papers presented at the symposium were the following: spontaneous tumours in mice, by P. R. Peacock; epidemiology of polyoma virus in a mouse colony, by M. H. Salaman & K. E. K. Rowson. The other papers dealt with cancer research and supply of experimental animals.

—R.M.

NUTRITIONAL AND METABOLIC DISORDERS

Horton, R. E. & Hickey, J. L. S. (1961). **Irradiated diets for rearing germfree guinea pigs.**—Proc. Anim. Care Panel **11,** 93-106. [Authors' abst. modified.] 4063

Complete rations for rearing germ-free guinea-pigs were sterilized successfully by a dose as low as 2 megarads from a Van de Graaff electron beam accelerator. While conventional g.pigs maintained on a natural diet sterilized at 3 megarads grew reasonably well and reproduced satisfactorily, this diet was inadequate for rearing germ-free animals. A semi-synthetic ration sterilized at 2 megarads produced germ-free animals of good quality as regards early growth and general physical condition. The fact that conventional animals receiving the sterilized semi-synthetic diet grew at a faster rate suggests that unidentified or additional growth factors are contributed by the action of the intestinal microflora. Observations relating to the size of the caecum and certain haematological values for both the germ-free and conventional animals are presented.

McCance, R. A., Ford, E. H. R. & Brown, W. A. B. (1961). **Severe undernutrition in growing and adult animals. 7. Development of the skull, jaws and teeth in pigs.**—Brit. J. Nutr. **15,** 213-224. 4064

The skulls were examined from 3 groups of pigs (a) 16 normal pigs killed at various ages from birth to 15 months, (b) 18 severely undernourished pigs which had died or were killed between 3 and 15 months and (c) 5 pigs underfed for 12–24 months and then fed a full diet. Skulls were sawn longitudinally, measured, and the teeth examined and X-rayed.

Undernutrition did not affect the size of the endocranial cavity as much as the rest of the skull, although it was smaller than normal. Growth of the lower jaw was less severely retarded than that of the upper jaw and thus it projected and in some cases there was serious malocclusion of teeth. Tooth development and eruption and the absorption of deciduous dentition were all delayed, but the crowns were of normal size, with the exception of the third molar. This led to overcrowding of the teeth and impaction of the molar surfaces of both deciduous and permanent teeth which became worn rapidly. The proportions of the skulls and jaws of the pigs in group (c) rapidly returned to normal but tooth abnormalities remained.

—E. J. Castle.

Storry, J. E. (1961). **Changes in blood constituents which occur in dairy cattle transferred to spring pastures.**—Res. vet. Sci. **2,** 272-284. [Author's summary modified.] 4065

Changes in the packed cell volume, the concentrations of plasma Ca, Mg, K and Na, and the concentrations of red blood cell K and Na which occur when dairy cattle are transferred from conditions of stall feeding to those of grazing pastures under different manurial treatments, were studied.

The plasma Mg concentrations fell significantly during the first 2 weeks at pasture and then rose again, but the recovery could not be associated with any change in the Mg content of the herbage. The magnitude of the fall in plasma Mg conc. for individual animals varied to such an extent that no effect of manurial treatment of pastures on this reaction could be demonstrated. Plasma Na concentrations fell over the first 2 weeks of grazing and then rose again, whilst red blood cell Na conc. rose immediately after the animals were turned out to graze and thereafter gradually returned towards the pre-grazing concentrations. No significant changes in the plasma Ca and K concentrations or the blood cell K conc. were found. The packed cell volumes fell in the second and third weeks and rose again slightly in the last week.

Concentrations of plasma Mg as low as 0·6 mg./100 ml. were found, in the presence of normal plasma Ca, K and Na concentrations, without the manifestation of any clinical signs of tetany. Analysis of blood samples taken from 3 field cases of grass tetany revealed reduced plasma concentrations of both Ca and Mg.

Although manurial treatments produced pastures which had extremely high protein

and potassium contents, no clinical cases of grass tetany occurred although certain animals were hypomagnesaemic.

Pross, E. (1961). Beitrag zur therapeutischen Beeinflussung der akuten Tympanie vom Typ der schaumigen Gärung beim Rind. **[Treatment of frothy bloat in cattle.]** — Tierärztl. Umsch. **16,** 274-278. **4066**

Oral administration of silicone compounds was superior to parenteral injection of substances which stimulate parasympathetic activity. The literature is discussed.—E.G.

Haenel, H., Gerriets, E., Müller-Beuthow, W., Gassmann, B., Plessing, H., Grütte, F.-K. & Erhardt, V. (1961). Versuche mit Aureomycin in nutritiver, therapeutischer und überhöhter Dosierung an Hühnerküken. **[Experiments in chicks with dietary chlortetracycline at supplementary, therapeutic and excessive doses.]**—Arch. Geflügelk. **25,** 179-206. [Summary in English.] **4067**

Six groups, each of 100 chicks, were fed for 8 weeks a ration containing 0, 10, 100, 1,000, 5,000 or 10,000 p.p.m. chlortetracycline. The control group showed nutritional disorders and symptoms of vitamin A and D deficiency, from which the other groups were free. The best growth and food conversion rates were seen in the group fed 1,000 p.p.m. There was a temporary depression of growth in the groups fed 5,000 and 10,000 p.p.m., but no other adverse effects. No differences were found between any of the groups in the bacterial populations of the small intestine and caecum, or between treated groups in the vitamin content and weight of the liver. Because of the possible development of resistant pathogens, levels higher than 100 p.p.m. should be restricted to therapeutic use.—M.G.G.

Hale, W. H., Sherman, W. C., Reynolds, W. M. & Luther, H. G. (1961). **The value of certain steroidal sapogenins in rations of fattening lambs and cattle.**—Proc. Soc. exp. Biol., N.Y. **106,** 486-489. **4068**

A study was made of growth rate, feed efficiency and carcass quality in fattening lambs and steers fed plant steroidal sapogenins, saponins and a natural source of unisolated sapogenins. Lambs fed smilagenin (isolated from *Agave lecheguilla*) showed considerably improved weight gains and food efficiency especially when fed at the level of 8 g. per ton total food, and similar results were obtained when ground *Agave lecheguilla* was fed in amounts equivalent to 8 g./ton of smilagenin. Sarsasapogenin and hecogenin at 8 g./ton gave comparable results to the smilagenin but diosgenin and tigogenin did not improve performance.

Steers fed 20 mg. of smilagenin daily showed weight gains similar to those of animals receiving 10 mg. stilboestrol daily.

—E. J. Castle.

Hatemi, N. & McCance, R. A. (1961). **The response of piglets to ammonium chloride.**—J. Physiol. **157,** 603-610. [Authors' summary modified.] **4069**

Ammonium chloride was administered to piglets 1–2 days old and to animals 10–12 weeks old weighing about 15 kg. In both groups the average pH of the urine rose and did not regain its initial level for 5–6 hr. In new-born animals the excretion of phosphates was at all times negligible and that of NH_3 did not increase significantly after giving the chloride. In older animals the excretion of phosphates fell but that of NH_3 rose significantly.

In new-born animals the chloride increased the excretion of potassium but not sodium. In older animals the excretion of both cations was increased.

Travis, H. F. & Schaible, P. J. (1961). **Effect of dietary fat levels upon reproductive performance of mink.**—Quart. Bull. Mich. agric. Exp. Sta. **43,** 518-521. [Authors' summary modified.] **4070**

The authors studied 523 adult and young mink during two reproductive cycles to determine the effects of dietary fat. Diets with fat concentrations ranging from 23–44% of dry constituents gave similar results during breeding, gestation, parturition and early kit growth. Food consumption decreased as the fat concentration increased. It was concluded that fat concentration in the diet need not be as low as thought necessary by mink farmers, provided that the fat is of high quality.

Sutmöller, P. (1961). **A study of mineral nutrition in cattle under the conditions of an underdeveloped region.** pp. 81. Amsterdam: Koninklijk Instituut voor de Tropen. [Thesis, Utrecht.] [In English.] **4071**

Results of a survey, of the Amazon Valley with the aid of FAO, the Brazilian authorities, the Netherlands "Hoorn" Institute for Animal Nutrition and the Institute for Tropical and Protozoal Diseases of the Veterinary Faculty of Utrecht, indicated

grave mineral deficiencies, particularly among cattle. Details were given of studies on several selected farms of soil, herbage, serum, liver biopsy, urine and hair samples, together with management methods. A cattle disease locally known as "mal de cai", resulting in sudden death, was probably the result of Na and K deficiency, combined with an imbalance of Ca, P and Mg. A condition characterized by nasal or conjunctival discharge was common in cattle grazing for prolonged periods in upland savannahs, deficient in Co. There was also Cu deficiency characterized by anaemia; brittleness of bones associated with lack of P; and posterior paralysis of unidentified aetiology. Mud eating is common among cattle. Control of these conditions is hampered by the lack of veterinarians and lack of laboratory facilities, inadequate transport and often unfavourable climate.—E.G.

Lampkin, G. H., Howard, D. A. & Burdin, M. L. (1961). **Studies on the production of beef from zebu cattle in East Africa. III. The value of feeding a phosphatic supplement.**—J. agric. Sci. **57,** 39-47. [Authors' summary modified.] **4072**

Dicalcium phosphate was fed as a phosphatic supplement to beef-type zebu cows and weaner calves grazing in the Kenya Highlands. The treatment caused an increase in the level of inorganic phosphate in the blood only during times of drought, when it also caused an improvement in the condition of the cows. A slight beneficial effect on fertility was noted throughout the experiment. Evidence was found that other nutritional factors were causing considerable variation and it is suggested that more attention should be given to improving the general level of nutrition of cattle during dry seasons.

Skerman, K. D., O'Halloran, M. W. & Munday, B. L. (1961). **The effect of cobalt bullets on milk production of dairy cattle.**—Aust. vet. J. **37,** 181-184. [Authors' summary modified.] **4073**

In an experiment using 26 matched pairs of cows in two herds grazing cobalt-deficient pastures on King Island, Tasmania, cobalt bullet treatment increased the mean production per lactation of fat-corrected (4%) milk by 1,150 lb. per cow in one herd and by 873 lb. per cow in the other. The mean concentration of vitamin B_{12} in milk was higher in treated cows than in controls.

Fearn, J. T. & Habel, J. D. (1961). **Parenteral copper therapy for sheep in South Australia.**—Aust. vet. J. **37,** 224-226. [Authors' summary modified.] **4074**

In typical copper-deficient country, both intravenous copper sulphate and subcutaneous copper glycinate proved efficacious in preventing the development of wool lesions. Copper glycinate appears to be a satisfactory and safe drug for use by the sheep owner. One to three injections a year of 45 mg. of copper either as the sulphate or as the glycinate should maintain adequate copper status.

Lucas, I. A. M., Livingstone, R. M. & McDonald, I. (1961). **Copper sulphate as a growth stimulant for pigs: effect of level and purity.**—Anim. Prod. **3,** 111-119. **4075**

Sixty-four pigs aged 8–9 weeks were divided into eight equal groups and fed the same basal diet until they reached approximately 200 lb. liveweight when most of them were slaughtered. Copper sulphate, either as a purified form (analytical reagent grade) or as a commercial grade was added to the diet at one of 4 levels: 16, 62, 125 or 250 p.p.m. Purity of copper sulphate did not affect growth rate, food conversion efficiency or carcass measurements. The copper sulphate only improved performance in pigs under 100 lb. liveweight and the most consistent increases in growth rate and food conversion occurred with levels of 125 and 250 p.p.m.
—E. J. Castle.

Walker, D. J., Harris, A. N. A., Farleigh, E. A., Setchell, B. P. & Littlejohns, I. R. (1961). **Muscular dystrophy in lambs in N.S.W.** — Aust. vet. J. **37,** 172-175. [Authors' summary modified.] **4076**

The condition reported in New South Wales resembled that described in New Zealand [*V.B.* **24,** 1998; **28,** 2596; **30,** 3000]. Affected lambs were stiff and weak, and had characteristic gross and histological lesions in skeletal and sometimes cardiac musculature and greatly increased concentrations of glutamate oxalacetate transaminase in serum with no increase in bilirubin. The growth of lambs on one property (but not on another) responded to selenium treatment.

Blaxter, K. L., McCallum, E. S. R., Wilson, R. S., Sharman, G. A. M. & Donald, L. G. (1961). **Prevention of enzootic muscular dystrophy by selenium administration.** — Proc. Nutr. Soc. **20,** No. 1 pp. vi-vii of Abstracts. **4077**

Three of 4 groups of (204) beef calves

received selenium as sodium selenate. Animals were examined clinically at intervals, and serum glutamic oxaloacetic transaminase activity determined. Muscle creatine determinations confirmed the presence of dystrophy in calves that died. The results with selenium compared favourably with those of previous experiments in which α-tocopherol was given, and showed selenium to be effective in reducing the incidence of muscular dystrophy. —E. J. CASTLE.

McAleese, D. M., Bell, M. C. & Forbes, R. M. (1961). **Magnesium-28 studies in lambs.**—J. Nutr. **74,** 505-513. **4078**

Magnesium-deficient and healthy lambs were dosed orally or intravenously with Mg^{28}. Distribution of the isotope in the various tissues was measured in addition to its rate of disappearance from plasma and whole blood. The excretory pathways were investigated.—R.M.

Smith, R. H. (1961). **Importance of magnesium in the control of plasma calcium in the calf.**—Nature, Lond. **191,** 181-182. **4079**

Calves fed an all-milk diet for a long time, but receiving low levels of vitamin D, can become both hypocalcaemic and hypomagnesaemic. Calcium balances were conducted on four of these calves, 4–5 months old, both before and after magnesium supplementation. Although calcium absorption was decreased and calcium excretion increased after the magnesium supplementation, the plasma calcium and magnesium rose to normal levels.—E. J. CASTLE.

Riser, W. H. (1961). **Juvenile osteoporosis (osteogenesis imperfecta) — a calcium deficiency.**—J. Amer. vet. med. Ass. **139,** 117-119. **4080**

The author gives a brief account of an osteopathy in young domestic and zoo feline and canine animals. It is suggested that the term 'osteogenesis imperfecta' for this condition be replaced by that of 'juvenile osteoporosis'. This disease, which is attributed to calcium deficiency, is evidently identical with that described in lions by Fiennes & Graham-Jones [*V.B.* **31,** 1215] to which the generally accepted term 'osteodystrophia fibrosa' was applied. The author is correct in discarding the term 'osteogenesis imperfecta' in relation to this condition, but the paper contributes no new knowledge of this disease.—R. N. FIENNES.

Nordin, B. E. C. (1961). **The pathogenesis of osteoporosis.** — Lancet, May 13th, 1011-1014 & 1015. **4081**

Because the essential feature is a reduction in bone mass, osteoporosis could be due to a diminished rate of new bone formation, an increased rate of resorption, or a combination of the two. A possible cause of increased bone resorption is long-continued negative calcium balance and, using illustrative cases, the author suggested this could be the cause of primary osteoporosis in man.—E.V.L.

Smith, H. & Taylor, J. H. (1961). **Effect of feeding two levels of dietary calcium on the growth of broiler chickens.**—Nature, Lond. **190,** 1200. **4082**

Two levels of calcium in the diet of broiler chickens from birth to 10 weeks of age were compared. Average liveweight gain, food consumption and food conversion efficiency were significantly higher in the chickens receiving 0·83% calcium in the diet than in the group receiving 1·35%. —E. J. CASTLE.

Abrams, J. T., Bridge, P. S., Palmer, A. C., Spratling, F. R. & Sharman, I. M. (1961). **Apparent hypovitaminosis A in young cattle in East Anglia.** — Vet. Rec. **73,** 683-690 & 691. [Authors' summary modified.] **4083**

Cattle kept in a yard were well-grown and well-fed, chiefly on home-grown foods, including cereals, dried sugar-beet pulp, straw and hay, but with limited access to green foods or other source of carotene or vitamin A. Some became blind with exophthalmos, lacrimation, and dilated pupils (with visible tapeta lucida). Other signs included nasal discharge, coughing, scouring and oedema. Less severely affected animals responded to vitamin A therapy.

Optic nerves from 4 of the animals were constricted as they traversed the optic canal; there was loss of myelin and axons, and a proliferation of abnormal astrocytes.

In this, the first clinical account of vitamin A deficiency in British cattle, attention is drawn to the increasing likelihood of the deficiency occurring under modern intensive systems of husbandry, especially when home-grown foods are used extensively.

Palludan, B. (1961). **The teratogenic effect of vitamin A deficiency in pigs.** — Acta vet. scand. **2,** 32-59. [In English. Summaries in German and Danish. Author's summary modified.] **4084**

Nine sows and gilts which throughout pregnancy or in the first third of it were depleted of vitamin A gave birth to 91 piglets all of which had malformations. The most frequent was microphthalmia; others were heart defects, diaphragmatic hernia, malformed and not ascended kidneys, underdevelopment of genital organs, internal hydrocephalus and herniations of the spinal cord. Of these malformations, only the last mentioned seems to be specific for vitamin A deficiency. This malformation may be due to retarded growth of the bone tissue in relation to the relatively normal growth of the nerve tissue.

Almejew, C. (1961). Enzootische Dystrophie der Herz- und Skelettmuskulatur (Weissmuskelkrankheit) der Lämmer. **[Enzootic dystrophy of heart and skeletal muscles (white muscle disease) in lambs.]** — Dtsch. tierärztl. Wschr. **68,** 302-305. [Summary in English.] **4085**

An outbreak of white muscle disease in lambs was prevented from recurring at the next lambing season by improvement of the diet of the flock, with particular regard to the vitamin E and mineral content. The clinical, P.M. and histological findings were described. —M.G.G.

Jarrett, I. G. & Filsell, O. H. (1961). **An effect of glucose on acetate metabolism in sheep.**—Nature, Lond. **190,** 1114-1115. **4086**

The rate of disappearance of acetate from the blood of six 2-year-old Merino wethers was estimated before and after a glucose injection (1 g./kg.). The sheep had been fed wheat hay chaff for 8 weeks previously, and two of them also received lucerne hay chaff for 2 days before the estimations were made. Administration of glucose was followed by a more rapid removal of acetate from the blood than normal. Rates of acetate disappearance were highest in the sheep fed lucerne. —E. J. Castle.

Gründer, H.-D. (1961). Die Dauertropfinfusion beim Rind. II. Behandlung der Azetonurie. **[Intravenous drip infusion in cattle. II. Treatment of ketosis.]** — Dtsch. tierärztl Wschr. **68,** 401-405. [Summary in English.] **4087**

Intravenous drip infusion of 10% solution of glucose at the rate of 3 litres in 24 hours cured ketosis in 33 of 42 dairy cows in one to three days.—E.V.L.

Newton, W. M. (1961). **Ketosis in swine.**—Illinois Vet. **4,** 33-35. **4088**

A condition in farrowing sows, which clinically and pathologically resembled ketosis of cows and ewes, was believed to be due to sudden depletion of liver glycogen reserves, resulting in hypoglycaemia, increased ketone production and eventually ketosis.—E.G.

See also absts. **3857** (effect of dietary fat and vitamin A on TB. in chicks); **3858** (serum protein and lipoprotein response to TB. in chicks fed various levels of fat).

DISEASES, GENERAL

Anon. (1961). **FAO/OIE Animal Health Year Book for 1960.** pp. 311 + viii. Rome: Food and Agriculture Organization. Paris: Office International des Epizooties. 15s. [In English, French and Spanish.] **4089**

This year's edition is bigger and better than the four preceding editions. Information on the disease situation in 136 countries, (including for the first time the U.S.S.R., China, Mongolia and Bolivia), occupies 203 pages. In addition there are sections on diseases of bees and fish, numbers of livestock and veterinarians, and ten special articles which include one on major changes in the livestock disease position in 1960 and others on foot and mouth disease, contagious bovine pleuropneumonia and African horse sickness. This yearbook has now attained a high degree of perfection and comprehension. It may be purchased from FAO sales agents in various countries (H.M. Stationery Office in the United Kingdom).—R.M.

Andrade dos Santos, J. & Tokarnia, C. H. (1960). Algumas observações sôbre a patologia de animais selvagens em cativeiro. **[Diseases of wild animals held in captivity.]** —Arq. Inst. Biol. Anim., Rio de J. **3,** 1-24. [Summary in English.] **4090**

The authors recorded tuberculosis in monkeys, a coati (*Nasua* sp.) and a lion; rabies in a jaguar; neoplasms in elephant, jaguar, monkey and lion.—R.M.

Backhouse, T. C. & Bolliger, A. (1961). **Morbidity and mortality in the koala (Phascolarctos cinereus).**—Aust. J. Zool. **9,** 24-37. [Abst. from authors' summary.] **4091**

Twenty-eight koalas, 26 of which had died exclusively from natural causes, were examined P.M. The probable causes of death and the numbers of cases involved were: different forms of pneumonia (6) including 2 where the primary lesion was trauma; hepatitis with suppurative cholangitis (3); infection with *Cryptococcus neoformans* (3); lymphoblastic leucaemia and an anaemia of unknown origin (2); cystic disease of the ovary complicated by infection (4); middle ear sepsis, ulcerative colitis, and cardiac failure associated with senility (1 each). In the remaining 7 cases the cause of death was indeterminate, though senility was the probable cause in 2. Two additional cases of cystic disease of the ovary occurred.

Heidrich, H. J. (1961). Die Reisetetanie des Rindes in meteorobiologischer Sicht. **[Meteorobiological aspects of transport tetany in cattle.]** — Berl. Münch. tierärztl. Wschr. **74,** 274-276. [Summary in English.] **4092**

Weather conditions over a year were related to 112 cases of transport tetany; no connexion was found with temperature but a significantly high number of cases occurred in periods immediately before worsening conditions.—E.V.L.

Bezeau, L. M., Bailey, C. B. & Slen, S. B. (1961). **Silica urolithiasis in beef cattle. IV. The relationship between the pH and buffering capacity of the ash of certain feeds, pH of the urine, and urolithiasis.** — Canad. J. Anim. Sci. **41,** 49-54. [Authors' abst. modified.] **4093**

Twenty-one feeds and four chemical compounds were fed to calves and the urine pH was recorded. Twelve of the feeds produced acid urine.

Four calves were fed for 6 months on rations designed to produce either an acid or alkaline urine. Siliceous urinary calculi developed in all calves. Urine pH by itself did not seem to be a factor in the incidence of silica urolithiasis.

Cornelius, C. E. & Bishop, J. A. (1961). **Ruminant urolithiasis. III. Comparative studies on the structure of urinary concretions in several species.** — J. Urol. **85,** 842-848. [Authors' summary modified.] **4094**

The gross and microscopic anatomy of calculous materials recovered from dogs, cattle, and sheep has been described. A close anatomical similarity in matrix-crystal interrelationships was found to exist between canine and human uroliths. Demineralized matrices of both canine and ruminant phosphatic calculous material revealed an intimate relationship between both mineral and matrix. The presence and importance of matrix in the formation of calculi in domestic animals is histochemically substantiated.

Santiago Luque, J. M. & Palacios Remondo, J. (1960). Estudio clínico y anatomopatológico de la hepatodistrofia tóxica del cerdo. **[Symptoms and lesions of toxic liver dystrophy of pigs.]**—An. Inst. Invest. vet., Madrid **10,** 33-46. [Summaries in English, French and German.] **4095**

Toxic liver dystrophy was studied in 3 lots of 7, 3 and 2 pigs. All had died within a month of weaning. Three had shown staggering and weakness, the others had died suddenly. The only specific lesions were seen in the liver, which in most cases had a mosaic appearance. Histological examination revealed 4 successive phases of the disease: oedema of Disse's spaces, vacuolar and hydropic degeneration of the cytoplasm, necrobiosis, and lobular haemorrhage.—M.G.G.

Bollwahn, W. (1961). Über Stressreaktionen und ihre Therapie beim Schwein. **[Stress reactions and their treatment in pigs.]** — Tierärztl. Umsch. **16,** 266-271. **4096**

Corticotrophin treatment was advocated for the prevention of post-operative shock, indigestion and acute stress in pigs. The adaptation syndrome in general was discussed.—E.G.

Douglas, S. W. & Palmer, A. C. (1961). **Idiopathic demyelination of brain-stem and cord in a miniature Poodle puppy.** — J. Path. Bact. **82,** 67-71. [Authors' summary modified.] **4097**

This paper describes the clinical and pathological features of a demyelinating disease in a 9-week-old puppy, with a progressive quadriplegia. Severe demyelination occurred in the tegmentum and cord; smaller foci were present bilaterally elsewhere in the brain. Nerve cells in the malacic regions were on the whole well preserved. Similar cases in Poodles have been described in North America. The cause of the disease is unknown.

Varachiu, N., Sălăgeanu, G., Solniţchi, A. & Ionescu, A. (1960). Modificările anatomopatologice în urma injectării suspensiilor de creier homolog la cîine. **[Organ lesions pro-**

duced in dogs by intravenous injection of homologous brain suspension.]—Lucr. Inst. Agron. Bucureşti Ser. C, No. 4 pp. 199-209. [In Roumanian. Summaries in French and Russian.] **4098**

Haemorrhagic and degenerative lesions developed in 55 dogs following i/v injection of homologous brain tissue suspension. They were most frequent and most severe in the intestinal mucosa, the liver, the kidneys and the spleen, but they were also observed in the c.n.s., eyes, heart, lungs, stomach, adrenals and bladder.—E.G.

Marthedal, H. E. & Velling, G. (1961). **Haemorrhagic syndrome in poultry.** — Brit. vet. J. **117,** 357-365. [Authors' summary modified.] **4099**

The disease designated in the literature "haemorrhagic syndrome" or "haemorrhagic disease" is briefly reviewed, with special reference to its occurrence in Denmark. Since 1954 there has been a constant increase in the number of outbreaks recorded and in 1960 the disease was diagnosed in 317 cases (5·2% of the total number of consignments of poultry submitted for autopsy). In some cases pronounced sero-haemorrhagic exudation under the skin of wings and legs and in breast muscles have been noted.

Rigdon, R. H., Ferguson, T. M. & Couch, J. R. (1961). **Spontaneous occurring muscular necroses and encephalomalacia in the turkey.** —Poult. Sci. **40,** 766-771. [Authors' summary modified.] **4100**

In a group of 34 turkeys focal areas of necrosis were present in striated muscles throughout the body, their extent varying in different anatomical sites of the same bird, as well as in different birds. A second, rarer lesion was encephalomalacia. Some turkeys developed paralysis, pendulous crop, or an enlarged tibio-metatarsal joint. The aetiology of the lesions in the striated muscle and in the brain is discussed.

Rothe, W. E. & Grenan, M. M. (1961). **Radioprotection by mitotic inhibitors and mercaptoethylamine.** — Science **133,** 888. [Authors' summary.] **4101**

In the mouse, chemical interference with cellular proliferation alters the radiosensitivity of the bone marrow, and this results in protection from otherwise lethal X-irradiation. When intestinal damage is minimized by appropriate timing and dosage, many mitotic inhibitors increase radioresistance and enhance the protective effects of mercaptoethylamine.

Shively, J. N., Andrews, H. L., Kurtz, H. J., Warner, A. R., Jr. & Woodward, K. T. (1961). **Radiosensitivity of swine from irradiated parentage.**—Proc. Soc. exp. Biol., N.Y. **107,** 16-19. [Authors' summary modified.] **4102**

The lethal doses of radiation for 12-week-old offspring from non-irradiated swine, from irradiated swine, and from an irradiated boar and non-irradiated sows were much the same, so were survival times for progeny of the different parents.

Lindop, P. J. & Rotblat, J. (1961). **Long-term effects of a single whole-body exposure of mice to ionizing radiations. I. Life-shortening. II. Causes of death.**—Proc. roy. Soc. Ser. B. **154,** 332-349 & 350-368. **4103**

The authors concluded that the reduction of life-span of mice irradiated with low doses (50 to 457 r) was due to acceleration of the usual causes of death, and not the induction by radiation of specific diseases. The probability of any one disease occurring remained the same in irradiated as in the control animals. In mice given high doses (549 to 780 r) a definite increase in incidence of neoplastic diseases was established.—R.M.

Barreira, F., Mendes, J. A. & Neves, E. M. (1960). Determinação do radioestrôncio em ossos. I. Distribuição no esqueleto do ovino. [**Determination of radiostrontium in bones. I. Distribution in skeleton of sheep.**]—Rev. Cienc. vet., Lisboa **55,** 282-284. [Summary in English.] **4104**

The concentration of Sr^{90} varied greatly in the different parts of the skeleton of a sheep aged 18 months, ranging from 4 $\mu\mu$c./g. of ash in the tarsus to 181 $\mu\mu$c./g. in the anterior phalanx.—M.G.G.

Nowak, H. F. & Kucharski, J. (1961). **Effect of polyvinyl alcohol on the distribution of iodine-131 in the internal organs, fluids and excreta of rabbits.**—Nature, Lond. **191,** 665-667. **4105**

When radio-iodine was dissolved in polyvinyl alcohol more was taken up by the thyroid, less was taken up by parenchymal organs, and it was excreted more rapidly in the urine, compared with solutions of the isotope in saline.—E.G.

Colombo, S. & Marazza, V. (1961). Contributo alla conoscenza degli aneurismi coronarici del

bovino e del cavallo. **[Coronary aneurysm in cattle and horses.]**—Clin. vet., Milano **84,** 209-225. [Summaries in English and German.] **4106**

An account of the pathology of seven cases in cattle and one in a horse.—R.M.

Czub, E. (1961). Die Herzfunktionen unter dem Einfluss von Calciumlösungen beim Rind. Elektrokardiographische Untersuchungen unter besonderer Berücksichtigung der Rhythmusstörungen. **[Cardiac function in cattle treated with calcium.]**—Dtsch. tierärztl. Wschr. **68,** 298-301. [Summary in English.] **4107**

Cattle given i/v infusions of calcium gluconate or calcium chloride developed bradycardia or sinoatrial block. If the Mg content of the $CaCl_2$ soln. was raised, extrasystoles and sinus tachycardia were observed. —M.G.G.

Kutas, F. & Karsai, F. (1961). **The diagnostic value of transaminase and cholinesterase determinations in hepatic disease of domestic animals.**—Acta vet. Acad. Sci. hung. **11,** 277-288. [In English.] **4108**

Hepatic degeneration was induced by oral administration of CCl_4 to cattle, horses and dogs. There was a rapid increase in the plasma transaminase level, reaching a peak in 2 to 3 days; fluctuations in plasma cholinesterase were insufficient for diagnostic purposes. The transaminase test was found to be a sensitive indicator of the severity of acute hepatic diseases, but was less useful in chronic diseases.—E.V.L.

Cameron, G. R. & Hou, C. T. (1961). **The response of the intrahepatic bile-ducts to chemical injury.**—J. Path. Bact. **82,** 95-107. [Authors' summary modified.] **4109**

Regeneration of the intrahepatic bile-ducts after direct chemical injury is rapid and complete. Associated liver necrosis is periportal and perilobular, and is caused chiefly by damage and thrombosis of the intrahepatic veins and arteries, although liver cells may be killed by the agents regurgitating into the sinusoids. Massive infarction of the corresponding liver lobes is a not infrequent complication. Cholangitis and cholangiolitis often develop, but the affected bile-ducts soon recover or occasionally pass into a stage of chronic obliterative inflammation.

Much bile-duct proliferation follows chemical injury and it may be mild or intense, transient or lasting according to co-existing factors. Repair includes a stage of fibrous band formation which mimics localized biliary cirrhosis, but which sooner or later undergoes complete resolution.

Hofmeyr, C. F. B. (1960). **Comparative dental pathology (with particular reference to caries and paradontal disease in the horse and the dog).** — J. S. Afr. vet. med. Ass. **31,** 471-480. **4110**

A general discussion.—R.M.

POISONS AND POISONING

Burden, E. H. W. J. (1961). **The toxicology of nitrates and nitrites with particular reference to the potability of water supplies. A review.**—Analyst **86,** 429-433. **4111**

B. discussed the literature on the lethal doses of nitrate and nitrite for various animals, including data from annual reports of the Government Analyst in Sudan which indicated that water containing 320 p.p.m. of nitrate nitrogen might prove fatal for cattle. —R.M.

I. Buntain, D. (1961). **Deaths in pigs on a high copper diet.**—Vet. Rec. **73,** 707-713. **4112**

II. Allcroft, R., Burns, K. N. & Lewis, G. (1961). **Effect of high levels of copper in rations for pigs.**—Ibid. 714-718. [Authors' summaries modified.] **4113**

I. Serious losses in fattening pigs associated with the feeding of meal to which a copper supplement had been added are described and discussed in relation to recorded cases of chronic copper poisoning. The dangerously high copper levels found in the liver and kidneys of all pigs examined together with some other unidentified toxic factor in the diet may have caused the losses.

II. Meals containing various levels of added copper sulphate were fed to pigs from weaning to bacon weight to study accumulation of Cu in tissues, development of toxic symptoms and effects on growth rate. No significant increase in live-weight gain was found on diets containing between 0·06 and 0·16% added copper sulphate. Additions of 0·2 and 0·4% reduced growth, caused jaundice and the death of 3 out of 7 pigs. Despite careful mixing, wide variations were found in the copper content of the meal at each level of supplementation.

Liver Cu increased sharply on diets containing more than 0·06% added copper sulphate (188 p.p.m. Cu) but no toxic symptoms were produced on levels up to 0·16% copper sulphate. Concentrations of 0·2 and 0·4% were toxic.

While the results suggest that a high content of Cu in the liver is not necessarily toxic by itself, it appears that above a certain liver concentration other factors may precipitate a syndrome attributable to Cu toxicity.

Todd, J. R. & Thompson, R. H. (1961). **Methaemoglobin in chronic copper poisoning of sheep.**—Nature, Lond. **191**, 89-90. **4114**

Estimations in 3 affected sheep gave levels of blood copper 1,000 to 1,480 μg./100 ml. and methaemoglobin 3·5 to 3·8 g./100 ml. compared with 170 μg. and 0·1 g. respectively in normal sheep. The methaemoglobin was mainly intracorpuscular and it constituted 25 to 35% of the total haemoglobin.—E.V.L.

Watt, J. G. & Doxey, D. L. (1961). **A case of warfarin poisoning in a Labrador bitch.** — Vet. Rec. **73**, 548-551 & 552. [Authors' summary modified.] **4115**

Warfarin poisoning was treated by exchange transfusion of whole blood and parenteral administration of water-soluble analogues of vitamin K, and the dog recovered.

Gallagher, C. H. (1960). **The effect of pyrrolizidine alkaloids on liver enzyme systems.**— Biochem. Pharm. **3**, 220-230. [Author's summary modified.] **4116**

The pyrrolizidine alkaloids, lasiocarpine and heliotrine, inhibit enzyme systems which require pyridine nucleotides for electron transfer; they do not affect cytochrome oxidase activity and stimulate succinoxidase activity when mitochondria are suspended in 0·25 M sucrose. Neither alkaloid influenced the activity of L-malic dehydrogenase or succinoxidase in water-disrupted mitochrondria. The effect on mitochondrial metabolism may be common to pyrrolizidine alkaloids generally. The relevance of this mode of action to the acute hepatotoxic effects of the pyrrolizidine alkaloids in animals is discussed.

Penny, R. H. C., David, J. E. & Wright, A. I. (1961). **Heinz-Ehrlich bodies associated with kale feeding.**—Vet. Rec. **73**, 747-748. **4117**

In blood from a heifer with suspected kale poisoning, 55% of the r.b.c. contained Heinz-Ehrlich bodies. The bodies were also found in the r.b.c. of 4 Friesian heifers fed 50 lb. kale daily for 3 months but not in the blood of four controls. One heifer became ill after one month of the kale feeding but recovered when kale feeding was stopped. The Heinz bodies disappeared slowly in all four heifers once kale feeding ceased.

—E. J. Castle.

—Carnaghan, R. B. A. & Sargeant, K. (1961). **The toxicity of certain ground nut meals to poultry.**—Vet. Rec. **73**, 726-727. **4118**

During the first 6 months of 1961 thirty-seven outbreaks of so-called 'X' disease in young turkeys, ducklings and pheasant chicks, were diagnosed at Weybridge. Diagnosis was based on the presence of microscopic liver lesions. Where details of the rations fed were known Indian ground-nut meal was found to be a constituent. In experiments in which samples of these rations and extracts of the Indian meal were fed to ducklings, it was shown that the Indian meal contained a toxic principle similar to that found in Brazilian and East African samples, although the toxicity was less.—E. J. Castle.

Grinnell, E. H., Johnson, J. R., Rhone, J. R., Tillotson, A., Noffsinger, J. & Huffman, M. N. (1961). **Oestrogen protection against acute digitalis toxicity in dogs.** — Nature, Lond. **190**, 1117-1118. **4119**

Tests on 5 ovariectomized dogs indicated considerable protection by the steroid 1, 3, 5, (10), 16-oestratetraen-3-ol methyl ether against digitalis toxicity.—E.V.L.

Evans, W. C., Evans, I. A., Axford, R. F. E., Threlfall, G., Humphreys, D. A. & Thomas, A. J. (1961). **Studies on bracken poisoning in cattle. VII. The toxicity of bracken rhizomes.** — Vet. Rec. **73**, 852 & 853. [Authors' summary modified.] **4120**

Bracken rhizomes if eaten by cattle can cause bracken poisoning. The toxic factor is present in the rhizomes in at least 5 times the concentration which normally occurs in the fronds. Stock should be denied access to ploughed bracken-land containing appreciable quantities of exposed rhizomes.

Adler, J. H. & Egyed, M. (1961). **[Trigonella foenum-graecum poisoning in sheep.]** — Refuah vet. **18**, 20-21. [In Hebrew. In English p. 45.] **4121**

The condition was diagnosed in 4 large

flocks and in a number of individual sheep owned by smallholders. The clinical signs were in general similar to those reported in cattle [see *V.B.* **29,** 3272]. Respiratory distress and cardiac arrhythmia were also noted. P.M. examination of a slaughtered sheep revealed ascites, s/c oedema, hydropericardium, and mild parenchymatous degeneration in the liver. The condition was reproduced experimentally in 11–20 days in 2 sheep fed exclusively on *T. foenum-graecum* straw. After 2 months on this ration, they were returned to a normal diet and recovered after 2 and 6 months.—M.G.G.

Gardiner, M. R. (1961). **Lupinosis—an iron storage disease of sheep.**—Aust. vet. J. **37,** 135-140. **4122**

Development of microscopic lesions in the livers of sheep fed lupins is described in detail. The stalks were the most toxic part of the plant. After several weeks of feeding on lupins abnormally high concentrations of iron were found in the serum and, particularly, in the liver of sheep. Liver copper was also increased whereas the concentrations of cobalt, vitamin B_{12} and folic acid in the liver were reduced. Serum levels of glutamic oxaloacetic transaminase, alkaline phosphatase and bilirubin are raised in lupinosis. Leucopenia is a consistent accompaniment of the disease. Lupinosis appears to increase susceptibility to infestation with *Haemonchus contortus* and also alters the ruminal population of microorganisms.—C. H. GALLAGHER.

Hackbarth, J. (1961). **Lupinosis in the light of old and new evidence.** — J. Aust. Inst. agric. Sci. **27,** 61-67. [Author's summary.] **4123**

Evidence is presented that lupin alkaloids are the cause of lupinosis. Administration of lupin alkaloids to experimental animals has given variable results, but the effects produced have been sufficient to account for lupinosis symptoms as they occur in the field. Strong support for this conclusion comes from the fact that in no recorded case have "sweet" (low alkaloid) lupins ever caused lupinosis.

The evidence refutes any hypotheses that lupinosis is caused by amino-acid deficiencies or overfeeding with protein. Nor has recent work supported the theory that a special toxin, or "ictogen", must be present apart from the alkaloids. If such a substance exists, its origin must be dependent on the presence of a high alkaloid content.

It is concluded that the best way of avoiding lupinosis lies in the use of sweet lupin varieties.

I. Döbereiner, J., Tokarnia, C. H. & Canella, C. F. C. (1960). Intoxicação experimental pela "salsa" (Ipomoea asarifolia R et Schult.) em ruminantes. [**Experimental poisoning by Ipomoea asarifolia in ruminants.**]—Arq. Inst. Biol. Anim., Rio de J. **3,** 39-57. **4124**

II. Tokarnia, C. H., Döbereiner, J. & Canella, C. F. C. (1960). Estudo experimental sôbre a toxidez do "canudo" (Ipomoea fistulosa Mart.) em ruminantes. [**Toxicity of Ipomoea fistulosa in ruminants.**] — Arq. Inst. Biol. Anim., Rio de J. **3,** 59-71. **4125**

III. Tokarnia, C. H., Canella, C. F. C. & Döbereiner, J. (1960). Intoxicação experimental pela fava da "timbaúba" (Enterolobium contortisiliquum (Vell.) Morong.) em bovinos. [**Experimental poisoning of cattle by the fruit of Enterolobium contortisiliquum.**]—Arq. Inst. Biol. Anim., Rio de J. **3,** 73-81. [English summaries modified.] **4126**

I. These studies consisted of administration of fresh "salsa" plant to cattle, sheep and goats, with clinical observations, and the gross and microscopic examinations of the organs of the animals which died. It induced nervous symptoms in all three species. The authors found no lesions which could be ascribed to ingestion of the plant. The histopathological findings consisted of slight hyperaemia and small haemorrhages in the central nervous system and more pronounced hyperaemia in the kidneys.

II. The plant *Ipomoea fistulosa* is called "canudo". Three oxen, five sheep and three goats were fed during long periods with the plant. Cattle developed progressive weakness, became languid and the coat became rough. One was killed *in extremis* after having been in the experiment for 90 days. The other two cattle were discharged after having been fed 96 days with the plant.

Sheep showed lack of appetite for "canudo", and listlessness; they died after between 29 and 81 days and after having been sick for 2 to 14 days.

The goats showed well defined nervous symptoms. One goat died on the 38th day of being fed with "canudo" and after having shown symptoms for three days; a second showed symptoms on the 46th day but did not die. The third goat refused to eat the plant.

Gross lesions in the ox consisted in an accentuated oedema of the abomasal mucosa, petechial haemorrhages in the first portion of

the small intestine, and thickening of the mucosa of the second part of the small intestine. Histopathological studies revealed lymphocytic infiltration and oedema in the mucosa and submucosa of the intestine. In the other animals only minor alterations were found, which could not be ascribed to the ingestion of the plant.

III. In cattle, ingestion of fruit of the "timbauba-tree" caused loss of appetite, lassitude, sometimes foul smelling diarrhoea or other digestive disorders and sinking of the eyeballs, causing death when a certain amount was ingested, within hours or days. Amounts not causing death, when repeated, initially caused symptoms, which in succeeding days disappeared. Cattle which already had ingested various amounts of the fruits, reacted less severely or more slowly after one more dose.

Lesions consisted of liver degeneration in a few cases and discrete kidney changes in all of them.

Bull, L. B. (1961). **Liver diseases in livestock from intake of hepatotoxic substances.** — Aust. vet. J. **37**, 126-130. **4127**

The botanical and geographical origin of pyrrolizidine alkaloids and their relationship to liver disease in livestock is discussed. References are included to historical, observational and experimental studies with pyrrolizidine alkaloids from a variety of plants. Particular attention is given to *Heliotropium* poisoning in sheep and cattle in Australia and to discussion of the pathology of pyrrolizidine alkaloid hepatosis. Brief reference is made to carbon tetrachloride poisoning of sheep, facial eczema of sheep and cattle, lupinosis of sheep, *Lantana* poisoning in cattle, selenium poisoning, and gossypol poisoning of pigs. Attention is drawn to occasional outbreaks of liver disease of undetermined aetiology in sheep in Australia and to the variation in susceptibility to hepatotoxins between species.—C. H. Gallagher.

Allen, M. R. & Kitts, W. D. (1961). **The effect of yellow pine (Pinus ponderosa Laws) needles on the reproductivity of the laboratory female mouse.**—Canad. J. Anim. Sci. **41**, 1-8. [Authors' abst. modified.] **4128**

An aqueous fraction of yellow pine needles contains a factor that depresses the uterine weight of immature mice; an ether fraction contains a toxic compound. Toxicity varies from month to month and was greatest in needles collected during winter. Both aqueous and ether extracts depressed the metabolism of newly-weaned mice for up to 8 hours after administration. Both caused embryonic mortality and reduced foetus weight. In addition, the parent liquor appeared to be responsible for a decrease of the uptake of I^{131} by the thyroid gland.

Swarbrick, O. (1961). **Sulphaquinoxoline toxicity in day-old chicks.**—Vet. Rec. **73**, 645-646. [Author's summary modified.] **4129**

Serious mortality in day-old chicks was associated with the unnecessary use of sulphaquinoxoline.

McCarthy, P. H. (1961). **D.D.T. poisoning in young kangaroos (Macropus spp.).** — Aust. vet. J. **37**, 202. **4130**

Two young kangaroos, treated with 1% DDT, died following attacks of convulsions soon after dipping.—A. Culey.

Long, W. H., Newsom, L. D. & Mullins, A. M. (1961). **Endrin residues in the fat of lambs grazed on endrin-treated pasture.**—J. econ. Ent. **54**, 605-606. **4131**

Granules containing 2% endrin were distributed over pasture at the rate of 0·5 lb. endrin per acre, as though for the treatment of sugar-cane borer. Lambs in poor condition were allowed to graze the treated pasture for 55 days and then transferred to untreated pasture for a further 42 days. P.M. fat samples were taken at the change over and 14 and 42 days afterwards. Fat was graded as 'external' (superficial) or 'internal' (from near stomach or in thoracic cavity), and contained the following amounts of endrin in parts per million at changeover: 18–23 (internal), 11–14 (external). After 14 days on clean pasture: 20–24, 15–20; after 42 days: 9–14, 6–11. Thus, more endrin accumulated in the internal than in the external fat, and even six weeks' feeding on untreated pasture failed to lower the endrin content very much.—W. N. Beesley.

Cavanagh, J. B., Davies, D. R., Holland, P. & Lancaster, M. (1961). **Comparison of the functional effects of dyflos, tri-o-cresyl phosphate and tri-p-ethylphenyl phosphate in chickens.** — Brit. J. Pharmacol. **17**, 21-27. [Authors' abst. modified.] **4132**

Tri-p-ethylphenyl phosphate is unique amongst the neurotoxic organophosphorus compounds in not being an inhibitor of cholinesterase. The dysfunction it produces is also unusual: it produces a characteristic

high-stepping gait which develops at varying periods after i/m inj. but more regularly following oral administration. The character, onset and development of the toxic effects of diisopropyl phosphorofluoridate (dyflos), and tri-o-cresyl phosphate differ from those of tri-p-ethylphenyl phosphate. The different action of the latter was supported by histological evidence.

See also abst. **4211** (report, U.K.).

PHARMACOLOGY AND GENERAL THERAPEUTICS
(For treatment of specific infections see under the appropriate disease)

Carlson, R. H., Swenson, M. J., Ward, G. M. & Booth, N. H. (1961). **Effects of intramuscular injections of iron-dextran in new-born lambs and calves.**—J. Amer. vet. med. Ass. **139**, 457-461. [Authors' summary modified.] **4133**

Three ml. of iron-dextran containing 150 mg. of elemental iron, injected i/m into new-born lambs, changed the packed cell volume and haemoglobin level within a week, and the effects lasted for 4 weeks. Treated lambs were heavier at 8 and 12 weeks of age than untreated controls.

New-born calves injected with 24 ml. of iron-dextran (1·2 g. of elemental iron) per 100 lb. of body weight responded similarly.

A suggested dose for i/m inj. of iron-dextran for new-born calves and lambs was 12 mg. of elemental iron per pound of body weight. A second injection may be indicated at 4 to 6 weeks of age if other adequate sources are not available.

Andersson, N. S. E. (1961). **Clinical investigations on a new intramuscular haematinic.**—Brit. med. J. July 29th, 275-279. [Author's summary modified.] **4134**

A preparation containing an iron-sorbitol-citric-acid complex ("Jectofer") and intended for intramuscular injection has been studied from the aspects of tolerance and therapeutic effect in 39 cases. It was compared with iron-dextran ("Imferon") (34 cases). The clinical tolerance for the iron-sorbitol complex was good, and only mild local side-effects were noted. The therapeutic result was satisfactory. About 60% of the iron in the preparation was utilized and about 30% of the dose was excreted in the urine without noticeable effect on renal function.

Archer, R. K. & Franks, D. (1961). **Blood transfusion in veterinary practice.**—Vet. Rec. **73**, 657-660 & 661. [Authors' summary modified.] **4135**

Blood transfusion is a potentially dangerous operation and should only be performed when it is indicated. In most animal species, a single transfusion without regard to cross-matching is usually safe provided the recipient has never before had a transfusion. Repeated transfusions are potentially dangerous without cross-matching.

The infusion of saline is not much use (except in continued emesis) since it is excreted very rapidly. Plasma volume expanders, such as the dextrans, may be useful in certain species when the blood becomes concentrated. There is no equivalent of the human ABO blood group system in animals and there is no useful test for incompatibility which can be employed unless laboratory facilities are available.

Powers, T. E. (1960). **The transfer of antibiotics from the blood to milk in the isolated perfused caprine mammary gland.**—Dissertation, Ohio pp. 239. [Abst. from Diss. Abstr. **21**, 2323 (1961).] **4136**

Antibiotic levels of potassium benzylpenicillin, procaine benzylpenicillin, dihydrostreptomycin sulphate, and the tetracycline group were determined at hourly intervals for the blood perfusate as well as for the milk formed during the perfusion.

The period of time of perfusion required for the milk concentration to equal the plasma concentration indicated the relative rates of transfer. This rate was most rapid with the tetracycline group, followed by procaine benzylpenicillin, then potassium benzylpenicillin and dihydrostreptomycin sulphate.

Perfusion results were compared with antibiotic levels in live animals. The relative concentration of the different antibiotics in the milk of the live animal following parenteral therapy could be predicted by using the formula obtained for perfusion curves.

Hanson, D. J. (1961). **Local toxic effects of broad-spectrum antibiotics following injection.**—Antibiot. & Chemother. **11**, 390-404. [Summary in Spanish pp. 419-420. Author's summary modified.] **4137**

The local tissue changes in rabbits resulting from s/c and i/m injections of broad-spectrum antibiotics are reported. Chloramphenicol succinate and tetracycline produced the most severe necrosis. Oxytetracycline reconstituted, and whether in water or in propylene glycol, produced the least necrosis.

Tetracycline produced the greatest polymorphonuclear infiltration. Extravasated red blood cells were most prominent with chloramphenicol and tetracycline. Mononuclear cell infiltration was of a similar degree in all subcutaneous injections, but in intramuscular areas it was seen in the greatest degree with tetracycline and chloramphenicol. Thromboses of subcutaneous vessels and sloughs of the skin over the injection sites were most frequent with tetracycline and chloramphenicol.

Nerve changes following i/m inj. were studied for tetracycline and oxytetracycline only: only minimal degrees of nerve damage were found, with epineural inflammatory cell infiltrations, directly related to the severity of the general inflammatory response of the surrounding muscle.

Shelton, D. C. & Olson, N. O. (1961). **Effect of terephthalic acid on the activity of chlortetracycline and oxytetracycline.** — Avian Diseases **5**, 25-31. [Authors' summary modified.] **4138**

Twelve groups of 15 chicks each were placed on treated feeds one week prior to inoculation with the synovitis agent. Chlortetracycline was twice as effective as oxytetracycline. Terephthalic acid (0·5%) potentiated chlortetracycline 4 times and oxytetracycline 2 times. Weight gains and feed conversion data were essentially normal when treatment prevented systemic infection.

McDonald, M. W. & Beilharz, R. G. (1961). **Effect of furazolidone on growth of chickens.** —Aust. vet. J. **37**, 185-187. [Authors' summary modified.] **4139**

Furazolidone was fed to chickens at levels of nil, 0·02%, 0·04% and 0·06% over 7 days. Supplementation with 0·02% increased growth but higher levels depressed growth and feed consumption increased.

Feeding 0·04% furazolidone from hatching depressed weight at four weeks of age. It had no effect on calcification of the tibia. It was recommended that furazolidone at the curative level (0·04%) be restricted to the shortest practical period of feeding.

Wilkins, J. H. (1961). **The effect of a new analgesic induction agent on goats.**—Vet. Rec. **73**, 767-768. **4140**

I/m inj. of doses of 0·5–16 mg./kg. body wt. of "Sernyl" [1-(1-phenyl cyclohexyl) piperidine monohydrochloride], an analgesic used in human medicine, produced satisfactory analgesia and was well tolerated by goats. It did not cause cardiovascular and respiratory depression, and acted within 1–10 min. according to dosage.—E.G.

Kaemmerer, K. (1961). Laborversuche zur Potenzierwirkung von Propionylpromazin. **[Laboratory tests on the potentiating effect of propionylpromazine.]** — Vet.-med. Nachr. No. 1 pp. 16-24. **4141**

Propionylpromazine potentiated chloral hydrate or hexobarbitone anaesthesia in mice. —E.G.

Nathan, P. W. & Sears, T. A. (1961). **Some factors concerned in differential nerve block by local anaesthetics.**—J. Physiol. **157**, 565-580. [Authors' summary modified.] **4142**

The effects of local anaesthetics on conduction in myelinated and non-myelinated fibres of the spinal roots of the cat have been studied.

Smaller concentrations of anaesthetic are required to block small fibres than to block large fibres.

The minimum concentration of anaesthetic for blocking non-myelinated fibres also blocked the smaller myelinated fibres.

Still lower concentrations of anaesthetic blocked the very smallest myelinated fibres without blocking the group of non-myelinated fibres.

Pauling, L. (1961). **A molecular theory of general anesthesia.** — Science **134**, 15-21. [Author's conclusions modified.] **4143**

The hydrate-microcrystal theory of anaesthesia by non-hydrogen-bonding agents differs from most earlier theories in that it involves primarily the interaction of the molecules of the anaesthetic agent with water molecules in the brain, rather than with molecules of lipids. The postulated formation of hydrate microcrystals similar in structure to known hydrate crystals of chloroform, xenon, and other anaesthetic agents as well as of the substances related to protein side chains, entrapping ions and electrically charged side chains of protein molecules in such a way as to decrease the energy of electric oscillations in the brain, provides a

rational explanation of the effect of the anaesthetic agents in causing loss of consciousness. The striking correlation between the narcotizing partial pressure of the anaesthetic agents and the partial pressure necessary to cause formation of hydrate crystals provides some support for the proposed theory, but it is recognized that any theory based upon attraction of the molecules of the anaesthetic agent for other molecules would show a similar correlation, inasmuch as the energy of intermolecular attraction is approximately proportional to the polarizability (mole refraction) of the molecules of the anaesthetic agent. The proposed theory is sufficiently detailed to permit many predictions to be made about the effect of anaesthetic agents in changing the properties of brain tissue and other substances, and it should be possible to carry out experiments that will disprove the theory or substantiate it,

Clifford, D. H., Stowe, C. M., Jr. & Good, A. L. (1961). **Pentobarbital anesthesia in lions with special reference to preanesthetic medication.** — J. Amer. vet. med. Ass. **139,** 111-116. **4144**

The authors describe anaesthesia of five lions by pentobarbitone sodium, preceded by ataractics (promazine and meperidine). The ataractics facilitated restraint and assisted the action of pentobarbitone sodium. The recommended dose of meperidine is 11 mg./kg. body wt. and of promazine 4·4 to 9 mg./kg. Physiological estimations were made of blood, urine and temperature during anaesthesia. Pulse and respiratory rates were recorded at different stages. Of the five lions one died as the result of the anaesthetic and this was attributed to an excessive dose of meperidine at 22 mg./kg. combined with promazine at 4·4 mg./kg. In the other four lions surgical anaesthesia was induced and it was concluded that they would have survived, but all were destroyed before recovery. Work describing anaesthesia in wild animals is important because of its scarcity and this paper should be consulted in the original by those interested.

—R. N. Fiennes.

See also absts. **3848** (isoniazid in TB.); **3885** (failure of brucella to develop resistance to streptomycin); **3900** (chemotherapy of bact. infections in mice); **3907** (griseofulvin); **3911** (resistance of Nocardia to antibiotics); **3920** (trypanosomiasis); **3926-3930** (coccidiosis); **3936** (amicarbalide); **3940** (metronidazole); **4007-4017** (parasiticides); **4027-4036, 4041 & 4044-4046** (anthelmintics).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Ingram, D. L., McLean, J. A. & Whittow, G. C. (1961). **Increase of evaporative loss of water from the skin of the ox in response to local heating of the hypothalamus.**—Nature, Lond. **191,** 81-82. **4145**

Three Ayrshire bull calves aged 12 months were exposed to room temperatures of 10°–20°C. Sweat cups, for estimating the amount of evaporative water loss through the skin, were placed over thoracic, midflank and sacral regions of each calf. The temperature of the hypothalamus was raised to 41°C. for 3 min. by means of a radio-frequency voltage applied between 2 electrodes 15 cm. apart on either side of the midline, dorsal to the optic chiasma. The rate of loss of moisture increased in 31 or 35 instances although the magnitude varied, coupled with a rise in respiratory rate and skin temperature in those instances where initial temperatures were low. The rate of loss of moisture increased rapidly while the hypothalamus was being heated and continued to rise after the heating ceased, followed by a slow decline.

—Joyce E. Hammant.

Taneja, G. C. & Bhatnagar, D. S. (1960). **Thermo-regulatory mechanism in buffalo calves. I. Effect of shower and exercise on body temperature, pulse-rate and respiratory frequency.** — Indian J. Dairy Sci. **13,** 170-178. **4146**

Five buffalo calves were exercised for half an hour at midday, while 5 had water poured over them and 4 controls were tied up in the sun. The authors determined the effects on body temperature, breathing rate and pulse rate, their interdependence, and their correlation with air temperature and relative humidity.—M.G.G.

Smith, I. D. (1961). **Thermoregulation in the newborn Merino.**—Aust. vet. J. **37,** 205-210. [Author's summary modified.] **4147**

Thermoregulatory behaviour in the Merino lamb during the first 24 hours of life in a semi-arid tropical environment is described.

The temperature of the lamb recorded immediately after birth was slightly in excess of the parturient maternal temperature. Rectal temperature fell immediately after

birth but usually it rose again within 20 min. At atmospheric temperatures of more than 80°–85°F., this fall tended to disappear.

At two different times of the year at atmospheric temperatures of 75° to 85°F., similar rectal temperatures were recorded. Lambs exposed to high atmospheric temperatures were incapable of prolonged physical exertion, and this may be an important predisposing cause of lamb mortality.

Weiss, B. & Laties, V. G. (1961). **Behaviour thermoregulation.** — Science **133,** 1338-1344. **4148**

Rats with fur removed by clipping were each put for sessions in a chamber placed in a room at 2°C. Within the chamber was a lever, pressure on which by the rat switched on, for a few seconds, an infra-red heat lamp. At some point during a session the rats suddenly began to press the lever at a steady rate, and thus maintained body temperature. Clipped rats which had been kept at 2°C. for 5 hours immediately before being put in the chamber waited 2 hours before starting to press for heat, whereas rats kept at room temperature for that 5 hours waited 5 hours. Thyroidectomized rats started to press for heat earlier than intact rats. Rats acclimatized to cold by keeping them at 2°C. for about 1 month delayed pressing for heat for a longer period than did non-acclimatized rats kept at 25°C. The subcutaneous temperature of rats was recorded. It was found that by pressing for heat they were able to maintain a fairly constant peripheral temperature. Rats given several sessions in the chamber started to press for heat earlier in the later sessions than in the first.

The effect of heat on the body being practically instantaneous is a factor which enables the animal to maintain body temperature by behavioural means.—A. Brownlee.

Wilson, W. O., Abbott, U. K. & Abplanalp, H. (1961). **Evaluation of Coturnix (Japanese quail) as pilot animal for poultry.** — Poult. Sci. **40,** 651-657. [Authors' summary modified.] **4149**

Observations on physiology, development and morphology of the Japanese quail (*Coturnix coturnix japonica*) suggest its use as a pilot animal in poultry research.

The rate of embryonic development, as well as the growth of young quail, is more rapid than for the fowl. Embryonic mortality was most pronounced in the first three, and again in the last two days of incubation. Strong adverse effects on hatchability resulted from both increased egg storage time and aging of the hens.

Some individual hens laid over 300 eggs in their first year of production. Under good environmental conditions quail populations may produce double the egg mass per unit of body weight of good laying strains of fowls. Quail reach sexual maturity as early as 5 to 6 weeks of age; mature body size is attained at about 8 weeks in males and 9 to 10 weeks in females.

Naaktgeboren, C. & Zwillenberg, H. H. L. (1961). Untersuchungen über die Auswüchse am Amnion und an der Nabelschnur bei Walen und Huftieren, mit besonderer Berücksichtigung des europäischen Hausrindes. [**Proliferations on the amnion and umbilical cord of whales and ungulates, with special reference to the cow.**]—Acta morph. neerl.-scand. **4,** 31-60. [In German.] **4150**

The proliferations, which occur only in whales and ungulates, were classified into eight different types. In the cow they appeared when the embryo measured 7·5 cm. and they consisted of ectodermal epithelium; similar structures occurred in ewe and deer. There are 33 photographs and a colour plate. —R.M.

McCosker, P. J. (1961). **Paraphenylenediamine oxidase activity and copper-levels in mammalian plasmas.** — Nature, Lond. **190,** 887-889. **4151**

Total copper content of the plasma of several species of mammals was determined. M. attempted to correlate the *p*-phenylenediamine oxidase activity in the plasma to the indirectly-reacting fraction of the plasma copper. When the oxidase activity was expressed as activity/μg. indirectly-reacting Cu, the species differences were marked, in decreasing order of pig, man, cattle, dog, sheep, cat. The reason for these differences was discussed and it was concluded that of the 8 atoms Cu bound in the molecule of caeruloplasmin, all 8 were catalytically active in that derived from pig, only 4 in that from man and 2 in the molecule from the other species.—Joyce E. Hammant.

Charnot, Y. (1960). Répercussion de la déshydratation sur la biochimie et l'endocrinologie du dromadaire. [**Effects of dehydration on the biochemistry and endocrinology of camels.**]—Trav. Inst. sci. chérif., Sér. Zool. No. 20 pp. 167. **4152**

C. studied 17 camels at Rabat, Morocco. Determinations were made of water content and chemical composition of blood, urine and tissues, and iodine content of the thyroid gland before and after water deprivation. Adrenal function was assessed by chemical composition of the cortex and by urinary excretion of 17-ketosteroids. The results are presented and discussed in detail.—R.M.

Bachrach, D., Szabó, E. B., Baradnay, G. & Korpássy, B. (1961). **Histophysiological changes of the adrenal cortex of the rat in dehydration and rehydration.**—J. Endocrin. **23,** 1-8. **4153**

The authors concluded that dehydration following thirsting seems to be a particular type of stress, which exerts a stimulating effect on both external layers of the adrenal cortex alike.—R.M.

Rubini, M. E., Montalvo, G., Lockhart, C. P. & Johnson, C. R. (1961). **Metabolism of zinc-65.** — Amer. J. Physiol. **200,** 1345-1348. [Authors' abst. modified.] **4154**

Absorption, deposition, and excretion of $zinc^{65}$ was studied in mice, rats and dogs. When fed to animals it was poorly absorbed, but its long half-life made even the small portion absorbed physiologically significant. Absorption was obviated by feeding large quantities of non-radioactive carrier zinc. Injected $zinc^{65}$ chloride was first deposited, preferably in the pancreas, liver, and spleen, with only minor deposition in muscle and in the brain. Subsequently, a large proportion was transferred to bone. Excretion was mainly in faeces, presumably by pancreatic secretion. Injected non-radioactive zinc or treatment with 2, 3-dimercaptopropanol (BAL), Versene. or cadmium ion failed to alter body burden significantly. Cadmium decreased soft tissue $zinc^{65}$ deposition and increased accretion by the skeleton.

Simkiss, K. (1961). **Calcium metabolism and avian reproduction.**—Biol. Rev. **36,** 321-367. [Author's summary modified.] **4155**

A large number of factors influence the requirements of birds for calcium, but, at the time of reproduction, they retain increasing amounts of the element from their food. This phenomenon is under the control of the sex hormones.

Injection of oestrogens increases the level of Ca and P in the blood. This increase occurs mainly in the non-diffusible fraction of the blood calcium, and a similar increase occurs during reproduction in the female members of some fish, amphibia and reptiles. Blood Ca of the male is not affected by reproductive activity.

The various theories which have been proposed to explain the increase in non-diffusible calcium are briefly discussed. The theory relating these changes to the transport of yolk proteins is regarded as the most satisfactory one for normal conditions. The role of the parathyroid glands and the level of diffusible calcium are also considered.

Evidence is presented that much calcium is stored during reproduction in a special system of the bone marrow cavities. This medullary bone is formed under the influence of oestrogens and androgens, and provides a very labile source of calcium which is mobilized during the formation of the eggshell.

The structure of the avian eggshell is briefly described and its formation is related to changes which occur in Ca metabolism. Various theories are discussed to account for the calcification of the eggshell.

When the egg is incubated, the developing embryo is responsible for loosening the shell membranes from the rest of the eggshell. The chick which hatches from an egg contains about five times as much Ca as did the original egg contents. Thus the chick has obtained about 80% of its skeletal calcium from the calcium in the eggshell. S. discussed theories proposed to account for the transference of calcium from the eggshell to the developing bird.

Schaefer, K. E., Hasson, M. & Niemoeller, H. (1961). **Effect of prolonged exposure to 15% CO_2 on calcium and phosphorus metabolism.** —Proc. Soc. exp. Biol., N.Y. **107,** 355-359. [Authors' summary modified.] **4156**

During chronic respiratory acidosis, produced by prolonged exposure of g.pigs to 15% CO_2, plasma calcium increased and plasma phosphorus decreased. These changes appear to be related to increased parathyroid activity as evidenced by increased urinary phosphorus excretion. Ultrafiltrable calcium increased only slightly during uncompensated respiratory acidosis, and rose much higher during the period of compensation, when plasma inorganic phosphorus was much lower. Renal calcification occurred in g.pigs exposed for prolonged periods to 15% CO_2.

Brochart, M., Larvor, P. & Vissac, B. (1960). Influence de quelques facteurs alimentaires,

saisonniers et endocriniens sur le métabolisme de Ca, P, K, Na chez 2 couples de jumelles bovines univitellines. [**Effect of nutritional, seasonal and endocrine factors on the metabolism of Ca, P, K, and Na in two pairs of identical twin cows.**]—Ann. Zootech. **9,** 5-68. [Summary in English.] **4157**

Samples of blood, urine and faeces were analysed weekly for a year, and of hair every second month. The cows were housed throughout the year. The results were examined for influence of season and feeding; relationships between Ca, P. K and Na in blood, urine and faeces; interrelationships between the different elements; and fluctuations in the mineral content of hair. Further details are given in the English summary and in the eleven tables. There was a positive relationship between the plane of metabolism and total serum phosphorus, inorganic P in serum and P in urine. Variations in mineral content of hair caused by season were generally smaller than variations between each cow.—R.M.

Cowie, A. T. & Tindal, J. S. (1961). **The maintenance of lactation in the goat after hypophysectomy.** — J. Endocrin. **23,** 79-96. [Authors' summary modified.] **4158**

Five adult goats were hypophysectomized during lactation; within 10 days their milk yields dropped to a fifth or less of the pre-operative levels. Daily milk yield was increased by giving daily injections of anterior-pituitary extract from cattle or sheep.

Prolactin and somatotrophin appear to be major components of the lactogenic and galactopoietic complexes in the goat, but further study is required. A marked increase in water intake of one goat appeared to be associated with administration of somatotrophin. The possibility of species specificities existing in relation to prolactin are discussed.

Buschmann, H. & Schmid, D. O. (1961). **Transferrin-groups of foetal calf-serum.** — Nature, Lond. **190,** 1209-1210. **4159**

Blood group factors in embryos of cattle are genetically dependent and fixed in the mother cells of the erythropoietic system; with immune sera the factors can be identified in the early embryonic stage by the immunohaemolytic and inhibition tests. A study of foetal sera was made with starch-gel electrophoresis; by separation of the beta-globulins all transferrin groups so far observed in the serum of adult cattle of highland breeds (Fleckvieh, Brown Swiss) were demonstrable. [See also *V.B.* **31,** 3761.]—E.V.L.

Sturkie, P. D. & Textor, K. (1961). **Relationship of blood pressure level in chickens to resistance to physical stresses.** — Amer. J. Physiol. **200,** 1155-1156. [Authors' abst. modified.] **4160**

Hypertensive and hypotensive White Leghorns were subjected to low and high temperatures and to exercise. There were no significant differences in the response of hypertensive and hypotensive birds to high temperature. When hypothermia was induced by placing the birds in water at 20°C., survival times of the hypertensive males and females were significantly greater than for the hypotensive birds. When hypertensive and hypotensive birds were made to exercise (treadmill walking) the resistance to fatigue was significantly greater in the females with high blood pressure, but no differences were observed between the two groups of males; both hypertensive and hypotensive male birds exhibited considerably greater resistance to fatigue than did the females.

Ring, G. C., Blum, A. S., Kurbatov, T., Moss, W. G. & Smith, W. (1961). **Size of microspheres passing through pulmonary circuit in the dog.**—Amer. J. Physiol. **200,** 1191-1196. [Authors' abst. modified.] **4161**

After injection of microspheres into the pulmonary artery about half of spheres 2·8–4·0 μ in diameter were found in the systemic circuit during the first circulation, but only 6% of those 8 μ or larger got through the pulmonary circuit when compared with simultaneously injected tagged erythrocytes. If vessels are impeding the flow of spheres and are circular in cross section, then more than half of the erythrocytes must be distorted while passing through the pulmonary circuit. A continuous infusion of norepinephrine (1–4 μg./kg./min.) brings about a reduction in the percentage of the various sizes of spheres passing through the pulmonary vessels. This suggests vasoconstriction. Acetylcholine iodide (13–40 μg./kg./min.) usually diminishes the percentage of spheres 2·8 μ and smaller, which can go through the pulmonary circuit, but increases the percentage of microspheres 5·7 μ and larger. During prolonged inspiration the percentage of microspheres passing through in each group studied was less than during expiration. If all microspheres injected are to pass through the

pulmonary circuit in inspiration they must be 1·4 μ or smaller.

Nicol, T., McKelvie, P. & Druce, C. G. (1961). **Phagocytic activity of the recticulo-endothelial system.** — Nature, Lond. **190,** 418-419. **4162**

Twenty male mice weighing 20–25 g. received one i/v injection of 0·05 ml. of an 8 day culture of B.C.G. on Dubos medium. At weekly intervals the phagocytic activity was measured in 5 animals by estimating the rate of disappearance of a known amount of carbon particles. R.b.c. counts and the weights of the liver and spleen were also determined. Ten mice served as controls. Phagocytic activity increased, reaching a peak after 3 weeks. Thereafter it declined, accompanied by a corresponding enlargement of the liver and spleen. The r.b.c. counts were slightly reduced. It was concluded that the reticulo-endothelial phagocytes can be stimulated by non-oestrogenic substances.

—Joyce E. Hammant.

Shevtsova, N. I. (1961). **[Stimulation of the rumen by intravenous injection of sodium chloride or sodium sulphate.]**—Veterinariya, Moscow No. 7 pp. 59-60. [In Russian.] **4163**

Contractions of the rumen became three to five times more frequent 30 min. after i/v inj. of 200 ml. of 10–20% sodium chloride or sodium sulphate soln. into cows. The effect lasted for three hours. Calcium chloride did not have this action, but caused dyspnoea and cardiac arrhythmia.—R.M.

Phillips, G. D. (1961). **Physiological comparisons of European and zebu steers. I. Digestibility and retention times of food and rate of fermentation of rumen contents. II. Effects of restricted water intake.** — Res. vet. Sci. **2,** 202-208 & 209-216. [Author's summaries modified.] **4164**

I. Zebu steers digested about 3% more of the organic matter of low quality grass hay than did grade Hereford steers, and the rate of fermentation of the rumen contents was also higher, perhaps on account of their greater saliva production.

II. Restricting the water intake increased significantly the digestibility of the organic matter of the diet in Hereford steers, but the increase in zebu steers was small. Changes in the freezing point of rumen contents were possibly due to increased production of saliva when water was restricted, which in turn may have favoured fermentation and consequently digestibility.

The freezing points of the contents of the large intestines indicated differences, between the Hereford and zebu steers, in the absorption of water and osmotically active substances from the terminal gut. Restricting the water intake increased the absorption of water from the large intestine of both types of steer, but changed the freezing point of the contents only in the Herefords.

Kimberg, D. V., Schachter, D. & Schenker, H. (1961). **Active transport of calcium by intestine; effects of dietary calcium.**—Amer. J. Physiol. **200,** 1256-1262. [Authors' abst. modified.] **4165**

Almost the entire small intestine of young rats fed a diet low in Ca can transfer calcium from the mucosa to the serosa against concentration gradients. The active transport is maximal in duodenum, less in ileum, and least in the middle of the small intestine. Following the low-Ca diet, duodenal gut sacs transport Sr^{89} against concentration gradients, although strontium is transferred much less readily than is calcium. Vitamin D is required for the adaptive response of the active transport in duodenum and ileum. Younger rats respond to Ca deprivation earlier and more markedly than older animals. Removal of thyroid, parathyroid, pituitary or adrenal glands did not prevent response to the low-Ca diet, although these ablations did affect the active transport mechanism in rats on a given diet.

Storry, J. E. (1961). **Calcium and magnesium contents of various secretions entering the digestive tract of sheep.**—Nature, Lond. **190,** 1197-1198. **4166**

Ca and Mg were estimated in solutions of the ashed secretions of saliva, gastric juice, bile, pancreatic juice, Brünners' glands and caecum. The total amounts entering the digestive tract from the sources investigated averaged 27·18 m. equiv. of Ca and 16·12 m. equiv. Mg. It was suggested that proportionately similar amounts of these elements entered the bovine digestive tract.

—Joyce E. Hammant.

Storry, J. E. (1961). **Studies on calcium and magnesium in the alimentary tract of sheep. I. The distribution of calcium and magnesium in the contents taken from various parts of the alimentary tract. II. The effect of reducing the acidity of abomasal digesta in vitro on the distribution of calcium and magnesium.**

— J. agric. Sci. **57,** 97-102 & 103-109. [Author's summaries modified.] **4167**

The distribution of Ca and Mg in the contents of the reticulo-rumen sac, omasum, abomasum, small intestine, caecum and colon of the sheep was studied by means of ultrafiltration through collodion membranes. The concentrations of ultrafiltrable Ca and Mg in rumen fluid were insufficient for these elements to be absorbed as freely diffusing ions, whereas in the abomasum and duodenum the concentrations of ultrafiltrable Ca and Mg were in favour of a net uptake from the gut.

Increasing the pH of abomasal contents of the sheep *in vitro* reduced the concentrations of ultrafiltrable Ca and Mg as a result of the binding of these ions to suspended material in the digesta. In the presence of this material such binding prevented the precipitation of calcium phosphate and magnesium ammonium phosphate which would otherwise have occurred about pH 6·0. Formation of calcium and magnesium soaps was not a factor contributing to the reduced concentrations of ultrafiltrable Ca and Mg. At saturation the binding capacity of the material was greater for Ca than Mg. Although some of the binding sites were common to both ions calcium was more strongly bound. The bound and ultrafiltrable forms of both elements were in equilibrium.

Campbell, R. M., Cuthbertson, D. P., Mackie, W., McFarlane, A. S., Phillipson, A. T. & Sudsaneh, S. (1961). **Passage of plasma albumin into the intestine of the sheep.**—J. Physiol. **158,** 113-131. [Authors' summary modified.] **4168**

Intravenously administered ^{131}I-plasma albumin was catabolized very slowly by the sheep. Sodium iodide at a concentration of 0·01% in the drinking water was toxic: no untoward effect resulted from a concentration of 0·0025%. Following catabolism of the labelled protein increasing proportions of the excreted radioactivity appeared in the faeces.

Protein-bound radioactivity was present in digesta obtained from cannulae in the duodenum and jejunum along with much larger amounts of radio-iodide.

Sheep cannot use intravenously injected radio-iodide to produce protein-bound radioactivity in the digesta or faeces.

Fluids from isolated loops of jejunum of sheep which had received ^{131}I-serum albumin intravenously contained substantial amounts of protein identified as plasma albumin on the bases of electrophoretic behaviour and specific radioactivity.

The authors discussed the site of normal catabolism of plasma albumin and the possible role which passage of albumin into the small intestine may play in supplementing the quota of endogenous protein.

Ferrando, R., Froget, J. & Heude, B. (1961). Etude du transit alimentaire chez le poulet par la méthode radiographique. **[Radiographical study of alimentary transport in the fowl.]**—Rec. Méd. vét. **137,** 357-365. [Summaries in English and Spanish.] **4169**

In chicks up to 12 weeks old, faecal elimination of a dose of barium sulphate began 2–3 hours after oral administration, compared with 4½–5 hours in laying hens. Its passage through the digestive tract was followed. It appears that ingesta pass quickly through the proventriculus and only a small proportion enters the caeca. There are 6 radiographs.—M.G.G.

Magee, D. F. (1961). **An investigation into the external secretion of the pancreas in sheep.**—J. Physiol. **158,** 132-143. [Author's summary modified.] **4170**

Thomas-type pancreatic fistulae were constructed in seven sheep. Normal sheep secreted 3·1 ml./15 min. of pancreatic juice containing amylase activity equivalent to 100 mg. of maltose. Both fasting (48 hr) and the absence of abomasal contents in the duodenum halved secretion and amylase.

The pH of the duodenal chyme was believed to be an important regulator of pancreatic activity.

Balloon distension of the abomasum was without effect on secretory volume or amylase.

Crosfill, M. L. & Widdicombe, J. G. (1961). **Physical characteristics of the chest and lungs and the work of breathing in different mammalian species.** — J. Physiol. **158,** 1-14. [Authors' summary modified.] **4171**

Pulmonary compliance, resistance and chest-wall compliance have been measured in four individuals of mouse, rat, guinea-pig, rabbit, monkey, cat and dog.

There was little interspecific difference in pulmonary compliance except that rabbit lungs were more compliant, and human lungs less, than the other species. Lung resistance (per unit lung volume) tended to increase with the size of the animal.

Mice, rats, g.pigs and rabbits had very high chest-wall compliances and low

functional residual capacities compared with animals in the other four species. The frequencies of breathing mechanically most economical (optimal rates) were calculated for the individuals, and corresponded quite closely to the observed rates of breathing.

Frequency of breathing could vary considerably for constant alveolar ventilation, with little increase in work; this was especially true for the smaller animals.

Dellmann, H.-D. (1961). Histologische Untersuchungen über den Feinbau der Zona interna des Infundibulum beim Rind. [**Fine structure of the internal zone of the infundibulum in cattle.**]—Acta morph. neerl.-scand. **4,** 1-30. [In German.] **4172**

A histological study, with 8 photomicrographs.—R.M.

Crabo, B. (1961). **On the glycogen contents in the renal epithelium of some domestic and laboratory animals.** — Acta morph. neerl.-scand. **4,** 71-78. [In English. Author's summary modified.] **4173**

Glycogen was demonstrated histochemically in the collecting tubules of ox, sheep, pig, dog, rabbit, g.pig, rat and mouse, but was not present in cat. Glycogen was absent from glomeruli and the renal capsule. The kidneys of ruminants contained most glycogen; it was present in very small amounts in pig, mouse and rat.

Nicander, L., Abdel-Raouf, M. & Crabo, B. (1961). **On the ultra structure of the seminiferous tubules in bull calves.**—Acta morph. neerl.-scand. **4,** 127-135. [In English.] **4174**

Attention was paid to gonocytes, indifferent cells, spermatogonia, Sertoli cells and the basement membrane. There are seven electron photomicrographs.—R.M.

Welch, R. M., Hanly, E. W. & Guest, W. (1961). **The deoxyribonucleic acid (DNA) deviation in the semen spermatozoa of bulls of unknown fertility under two years of age and its relationship to motility, count and morphology.**—J. Morph. **108,** 145-163. **4175**

DNA was determined in 658 semen samples from 275 Santa Gertrudis bulls. Semen having the poorest motility, count and morphology had the lowest concentrations of DNA. By estimating the DNA content it was possible to predict, within certain limitations, the fertility of a bull.—R.M.

Hay, M. F., Lindner, H. R. & Mann, T. (1961). **Morphology of bull testes and seminal vesicles in relation to testicular androgens.** — Proc. roy. Soc. Ser. B. **154,** 433-448. **4176**

The growth and secretory activity of the seminal vesicles and the development and hormone activity of the testicles were directly related to the diameter of the seminiferous tubules.—R.M.

Kellas, L. M. (1961). **An intra-epithelial granular cell in the uterine epithelium of some ruminant species during the pregnancy cycle.** —Acta anat. **44,** 109-130. [In English. Summaries in French and German.] **4177**

Intra-epithelial granular cells were observed in large numbers in the intercotyledonary regions of the placenta in eight ruminant species. Their numbers increased as pregnancy proceeded. The role of the cells is unknown.—R.M.

van Lennep, E. W. (1961). **Histology of the placenta of the one-humped camel (Camelus dromedarius L.) during the first half of pregnancy.** — Acta morph. neerl.-scand. **4,** 180-193. [In English.] **4178**

Material was collected from eight camels slaughtered in Central Sudan. There are 15 photomicrographs. The author concluded that on a morphological basis the camel's placenta was intermediate between those of *Suiformes* and *Ruminantia*.—R.M.

Levvy, G. A., McAllan, A. & Hay, A. J. (1961). **Glycosidases in the corpus luteum.** —J. Endocrin. **23,** 19-24. [Authors' summary modified.] **4179**

The corpus luteum in cow, sow and woman is rich in six glycosidases. The activity of these enzymes in the follicular fluid and in the remainder of the ovarian tissue is usually negligible. The activities found in the corpora lutea of pregnant and non-pregnant animals were the same.

Sato, M., Shimizu, H. & Takeuchi, S. (1960). **On the thyroid gland activity of ruminant. I. The seasonal changes of serum protein-bound iodine in the dairy cattle.**—Tohoku J. agric. Res. **11,** 329-339. [In English.] **4180**

Monthly estimations of bound iodine in serum of 5 Holstein and 5 Jersey cows in various stages of pregnancy and lactation revealed no variations, except that values were higher in summer than in winter.

—Joyce E. Hammant.

Hoersch, T. M., Reineke, E. P. & Henneman, H. A. (1961). **Effect of artificial light and**

ambient temperature on the thyroid secretion rate and other metabolic measures in sheep. —J. Anim. Sci. **20,** 358-362. **4181**

Thyroid secretion rates were measured on 64 ewe lambs aged 12 months, maintained on a standard diet under controlled temperatures either 50° or 90°F., with varying amounts of artificial light: 4, 8, 12, 16, 20, 24 hours. The thyroxine substitution technique was employed for all secretion rate determinations and each trial lasted 30 days. The thyroid secretion rate of the animals maintained at 50°F. was three times that of the 90°F. group. Under both temperature conditions, increasing the amount of light produced a diphasic effect, with thyroid activity decreasing from 4–12 hrs. and thence progressively increasing. Ewes maintained at 50°F. gained weight faster and were more efficient at food conversion although the food consumption was similar in both temperature groups. Thyroid secretion rate was positively correlated with body weight gains and feed efficiency.

—Joyce E. Hammant.

Copp, D. H. & Davidson, A. G. F. (1961). **Direct humoral control of parathyroid function in the dog.**—Proc. Soc. exp. Biol., N.Y. **107,** 342-344. [Authors' summary modified.] **4182**

Control of parathyroid function was studied in dogs in which the isolated thyroid-parathyroid glands were perfused with blood having a high or a low calcium content. Blood low in calcium appears to release parathyroid hormone. The resulting rise in systemic blood calcium does not depend on a fall in the inorganic phosphate of blood.

Westpfahl, U. (1961). Das Arteriensystem des Haushuhnes (Gallus domesticus). **[Arterial system of the fowl.]** — Wiss. Z. Humboldt-Univ. **10,** 93-124. **4183**

A detailed account based on dissection of 42 fowls, and a comparison with previously published work.—R.M.

Arvy, L. (1961). I. Données histoenzymologiques sur la glande surrénale d'Ovis aries L. (Ovinae, Baird, 1857) var. des Causses du Lot. II. Contribution à l'histochimie de la glande surrénale chez Gallus domesticus L. et chez Anas boschas L. **[Histochemistry of the adrenal gland in sheep, fowl and duck.]** — C. R. Soc. Biol., Paris **155,** 25-27 & 69-71. **4184**

Histological sections of glands were examined for dehydrogenase, cholinesterase and phosphatases and by the potassium iodate reaction. Special attention was paid to cortical and chromaffin tissues.—R.M.

See also abstr. **4216** (book, animal vision); **4217** (book, comparative osteology).

LIVESTOCK HYGIENE

Nelson, G. L., Mahoney, G. W. A. & Berousek, E. R. (1961). **Hot weather shelter for lactating dairy cattle.**—Tech. Bull. Okla. agric. Exp. Sta. No. T-87 pp. 47. [Authors' summary modified.] **4185**

Two shelters were tried as a means of improving comfort for cows during hot summer weather. One was a completely enclosed and insulated masonry shelter equipped with an evaporative cooler and ventilating fans, the other a typical open-front shelter.

Experiments were conducted during four summers. Data were collected on temperature, humidity, and air motion in the shelters. No large differences among groups were observed which could be attributed to the type of shelter or environment provided. Differences in milk production among groups were not statistically significant.

The cows in the air-cooled barn and the open shelter appeared to be much more comfortable than the cows without shelter. Observations indicated that cows preferred shade outside rather than inside the shelters.

Muehling, A. J. & Jensen, A. H. (1961). **Environmental studies with early-weaned pigs.**—Bull. Ill. agric. Exp. Sta. No. 670 pp. 39. [Authors' summary modified.] **4186**

272 pigs were weaned at 2 to 2½ weeks of age. None of the supplementary heating units (heat lamp, heat pad, heated and unheated hovers) significantly affected growth rate of pigs confined for 2 or 3 weeks in a chamber having constant temperatures as low as 38°F., but pigs without supplementary heat required more feed per lb. of gain.

In one test in which temperatures varied from 25° to 66° F. and forced draughts were employed, pigs having access to heated hovers grew 6% faster on 25% less feed than unprotected pigs.

Although body temperature was not

affected much by environment, skin temperatures were very different when heat lamps provided supplementary heat. The piglets adapted themselves to constant temperatures as low as 38°F. when kept free from draughts and dampness. The optimum surface temperature of heat pads on the floor, as determined by apparent comfort of the pigs, was about 110°F.

REPRODUCTION AND REPRODUCTIVE DISORDERS

White, I. G. & Wales, R. G. (1960). **The susceptibility of spermatozoa to cold shock.** — Int. J. Fertil. **5,** 195-201. [Abst. from authors' summary.] **4187**

Although ram and bull spermatozoa are severely affected by rapid cooling, the authors concluded that cold shock was not as widespread a phenomenon as the literature implied. Dehydration of the lipid capsule might render spermatozoa more susceptible to cold shock. Resistance to cold shock was a property of the cell and it was little affected by the accessory secretions.

Blom, E. & Birch-Andersen, A. (1961). **An 'apical body' in the galea capitis of the normal bull sperm.** — Nature, Lond. **190,** 1127-1128. **4188**

Studying the ultrastructure of bull spermatozoa, fixed within 30 min. of collection in 1% osmium tetroxide, the authors detected a characteristic thickening along the front edge of the head of the galea capitis, completely enveloped in the cell membrane, which they named "apical body". It contained a narrow cylindrical structure or vacuole. Its presence was confirmed in sagittal sections of the head of 12 normal spermatozoa from 3 different bulls, but also in the galea capitis of rabbit spermatozoa.—E.G.

Burger, R. E., Shoffner, R. N. & Roberts, C. W. (1961). **Treatment of fowl sperm and developing embryos with deoxyribonucleic acid extracts.**—Poult. Sci. **40,** 559-564. **4189**

Four crude sources and 4 purified preparations of DNA from fowls and geese were used for treating fowl semen and for injecting into chick embryos. No traits of the donors of the DNA were observed in the chickens or late embryos or their progeny.

—M.G.G.

Hancock, J. L. & Hovell, G. J. R. (1961). **The effect of semen volume and number of spermatozoa on the fertility of intra-uterine inseminations of pigs.**—Anim. Prod. **3,** 153-161. **4190**

Sows were inseminated into the uterus, either with 20 ml. of a mixture of semen with egg-yolk, glucose and phosphate, or by a similar dose of diluted semen, followed by 100 ml. of the diluent alone. Three concentrations of spermatozoa were tested. Fertility was estimated from the percentages of cleaved or fertilized ova recovered P.M., 2–4 days after insemination, or from the number of foetuses counted 25 days after insemination. Percentages of cleaved ova were considerably higher in sows given 20 ml. of diluted semen alone, and the number of spermatozoa on ova was lower in those inseminated with 120 ml. The average number of foetuses per sow was 11·6 in those inseminated with 20 ml. of diluted semen, containing $10{\cdot}0 \times 10^9$ spermatozoa, and 7·1 in those inseminated with a conc. of $1{\cdot}0 \times 10^9$.—E.G.

Dun, R. B. & Restall, B. J. (1961). **Artificial insemination of Australian sheep.**—Aust. vet. J. **37,** 145-149. **4191**

The management and techniques which have proved, or are likely to be, successful in artificial insemination of sheep in Australia are reviewed. The possible uses of artificial insemination are summarized as are the reasons for the conservative attitude of stud breeders. It is concluded that at present artificial insemination has a place in the industry only as a special purpose technique.

—A. A. Dunlop.

Watson, R. H. (1961). **The influence of prejoining with vasectomized rams on the course of mating in the late spring and early summer.**—Aust. vet. J. **37,** 217-221. [Abst. from author's summary.] **4192**

Joining vasectomized rams with ewes two weeks before fertile rams were introduced had no advantages over the use of fertile rams at a similar time, unless mating in some ewes was delayed. But even then, fertile rams may be equally useful if the ewes which mate early are identified. Lambing may even be advanced by this procedure.

Lishman, A. W. & Hunter, G. L. (1961). **Synchronisation of the oestrous cycle in sheep. 2. Administration of progesterone daily or at three-day intervals.**—S. Afr. J. agric. Sci. **4,**

35-50. [In English. Summaries in French and Afrikaans.] 4193

Sixty ewes were divided such that half received 7 i/m injections each of 30 mg. progesterone at 3 day intervals and the remainder 21 injections, 10 mg./day. P.M.S. (500 i.u.) was administered s/c following another injection interval after the last dose of progesterone, to half the animals in each group. The onset of oestrus was observed and the animals allowed to mate. The degree of synchronization of oestrus was similar in the two groups, although a higher percentage of suboestrous cycles occurred when 30 mg. was administered every 3rd day. P.M.S. did spread the onset of oestrus when given after daily progesterone, but had no effect on the mean time of commencement. The fertility of the ewes was considered to be low.

—Joyce E. Hammant.

Ch'ang, T. S. (1961). **Reproductive performance of New Zealand Romney sheep grazed on red clover (Trifolium pratense) pastures.** —J. agric. Sci. **57**, 123-127. [Abst. from author's summary.] 4194

Ingestion of oestrogenic red clovers caused the ewe lambs to accept the male before the start of the normal breeding season. No corpus luteum was found in the ovary of these lambs. The subsequent reproductive performance of these ewe lambs at 2 years of age was not affected. Red clover did not affect the reproductive performance of the young ewes at 2 years of age, but did cause a protracted lambing season and a reduced level of lambing performance in the aged ewes at 6 years of age.

Nicol, T., Bilbey, D. L. J. & Druce, C. G. (1961). **Effect of tri-p-anisylchloroethylene, dienoestrol and stilboestrol diphosphate.**— Nature, Lond. **190**, 419-420. 4195

Fifty male mice, weighing 20–25 g. were used in groups of 5 for testing the compounds: tri-p-anisylchloroethylene administered s/c for 6 days in 0·5 mg. doses and orally in 1 mg. dosage for 6 and 12 days respectively; dienoestrol and stilboestrol each s/c in doses of 0·5 mg. daily for 6 days. The phagocytic activity of the r.e.s. was measured 2 days after the completion of the injections, together with determinations of r.b.c. counts and spleen and liver weights. All the substances were active stimulants of phagocytic activity, but that of tri-p-anisylchloroethylene was unaccompanied by hepatic enlargement. This may be because this pro-oestrogen is stored in the body fat and released gradually to be converted by the liver into a potent oestrogen and hence probably has greater clinical potentialities than the other synthetic oestrogens.

—Joyce E. Hammant.

Beard, D. C. (1961). **Hydroxyprogesterone acetate: use in estrogenic and progesterogenic states in the bitch.**—Small Animal Clinician **1**, 215-218. 4196

Daily oral doses of 1·8 mg./lb. body wt. of hydroxyprogesterone acetate, given to anoestrous bitches, prevented oestrus whilst treatment lasted. Normal cycles started again 2 weeks to 8 months after discontinuance of treatment. Daily doses of 3–6 mg./lb. terminated prolonged oestrus. The value of this drug for treating pseudopregnancy was discussed.—E.G.

Månsson, J. & Norberg, I. (1961). Höftledsdysplasi hos hund. Hormonellt framkallad avslappning av höftledens bandapparat hos valpar, åtföljd av en dysplasi av acetabulum. **[Dysplasia of the hip in dogs. Hormonally induced flaccidity of the ligaments followed by dysplasia of the acetabulum, in puppies.]** —Medlemsbl. Sverig. VetFörb. **13**, 330-332 & 335-339. [In Swedish.] 4197

After discussing the literature on this condition in dog and man (18 references), the authors presented results of preliminary experiments with two litters of puppies from normal parents. Hip dysplasia was produced experimentally in 4 of 5 puppies treated every third day from 2 days of age with either relaxin (6 mg.) or oestrogen (0·3 mg.) or both. Clinical examination, confirmed by X-rays, revealed an increased flaccidity of the ligaments of the hip joints after 2–4 weeks' treatment, and by 3 months of age pronounced dysplasia of the acetabulum. These findings are considered to give strong support to a theory propounded in human medicine that the disease is primarily caused by a hormonally conditioned flaccidity of the ligaments.—F.E.W.

Knudsen, O. (1961). **Sticky chromosomes as a cause of testicular hypoplasia in bulls.** — Acta vet. scand. **2**, 1-14. [In English. Summaries in German and Swedish.] 4198

Lagerlöf (1948) described a hereditary testicular hypoplasia in Friesians showing normal development up to spermatids but oligospermia. Knudsen (1958) attributed this

to "sticky" chromosomes. Five inbred Friesian bulls and 1 Red and White Swedish were sent in as totally infertile. Ten or more ejaculates were studied from each and also testicular tissue. Stained centrifuged ejaculate sediment was characteristically dominated by pyknotic nuclei. These were also evenly distributed, as shown in section, throughout the seminiferous epithelium of each affected testicle. Squash preparations of testicle showed sticky chromosomes forming bivalents in the primary spermatocytes, interfering overwhelmingly to render the subsequent course of cell division chaotic. Slight testicular hypoplasia was apparent clinically in these bulls.—F. L. M. Dawson.

Knudsen, O. (1960). **Testicular biopsy in the bull.**—Int. J. Fertil. **5**, 203-208. **4199**

K. discussed the applicability of various methods under practical conditions. Excision with electrocoagulation for haemostasis was suitable only for special cases. Aspiration biopsy using very fine needles (0·6–0·8 mm. external diam.) yielded material suitable for cytological diagnosis, but unsuitable for histology.—R.M.

Dawson, F. L. M. (1961). **Corpus luteum enucleation in the cow: therapeutic and traumatic effects.**—Vet. Rec. **73**, 661-669 & 670. [Author's summary modified.] **4200**

Enucleation was carried out in a series of 8 normal control cows and 44 cows discarded for failure to breed (including 24 in which the uterus appeared normal and 20 with endometritis, as differentiated by histopathology). Enucleation was done twice in 7 cows and once in 45. Ovulation was induced by 75% of the enucleations. Oestrus signs accompanied about half of these where the previous natural ovulation had been suboestrus, thus confirming previous work. The findings of Schütte were confirmed that only 33% of ovulations induced in endometritis cases were accompanied by well-expressed oestrus, as contrasted with 66 to 77% in cases with normal uterus. Enucleation as late as the 12th to 14th day after the previous ovulation was just as efficient as earlier enucleation in bringing about ovulation, so also was the partial enucleation of a crumbling corpus, but not mere crushing. Out of the total of 59 enucleations, the existing ovarian cycle remained unaffected by 7; in 4 to 6 cows enucleation was followed by cyclic stasis, lasting from a minimum figure of 6 days up to not less than 5 weeks. A further 4 enucleations precipitated cystic ovarian disease in the cows, and in one animal this resisted treatment. On this evidence cyclic stasis and cystic disease are the chief hazards attending corpus luteum enucleation. Bleeding was negligible when the previous ovulation had been silent, but relatively free when this had been accompanied by oestrus or when the uterus was occupied. In only 2 cases did enucleation result in the formation of bursal adhesions which might have interfered with fertility.

Ryle, M. (1961). **Early reproductive failure of ewes in a hot environment. I. Ovulation rate and embryonic mortality.**—J. agric. Sci. **57**, 1-9. [Author's summary modified.] **4201**

Twenty-four Merino ewes acclimatized to heat were compared with 24 kept at normal temperatures, with respect to ovulation rate and embryonic loss by 25 days' pregnancy. Possible modifying effects of thyroxine level, vitamin A intake and progesterone level were sought.

While the differences between the hot-room and yard groups as a whole were not significant, in the former there were fewer ovulations, a smaller proportion of the potential embryos actually began to develop and, of these, a larger proportion had died by 25 days' pregnancy. Consequently only 13 hot-room ewes contained live embryos compared to 20 in the yard; the total numbers of live embryos were 14 and 27, respectively.

In both groups the proportion of potential embryos developing and the proportion of actual embryos surviving at 25 days' pregnancy were greater when thyroxine injections were given. Thyroxine had no effect on ovulation rate, but it increased the proportion of hot-room ewes with live embryos.

Cole, R. K. (1961). **Paroxysm—a sex-linked lethal of the fowl. With a note on the xl lethal.**—J. Hered. **52**, 47-52. **4202**

A sex-linked recessive gene in fowls, causing paroxysm, stunted growth, stilted gait and eventually death in hemizygous females, was described. Hatching and early growth were apparently normal. Paroxysm was induced by noise, bright light, handling, sudden movement or any other unexpected auditory or visual stimulus, usually between 12–42 days of age.—E.G.

See also absts. **3886** (leptospiral vaccine for control of bovine abortion); **4002** (aspermatogenesis induced by testicular antigen uncombined with adjuvant); **4005** (failure to reduce blowfly population by sterile male method); **4070** (effect of dietary fat levels upon reproductive performance in mink); **4174** (ultrastructure of the seminiferous tubules in bull calves); **4175** (deoxyribonucleic acid content and fertility of bull semen); **4176** (morphology of bull testes and seminal vesicles in relation to androgens); **4177** (epithelium of uterus during pregnancy in ruminants); **4178** (placental histology in the camel); **4179** (glycosidases in the corpus luteum); **4209** (report, U.K.); **4220** (book, breeding and management of mice); **4221** (book, animal husbandry in Asia and the Americas).

ZOOTECHNY

Britz, W. E., Jr., Fineg, J., Cook, J. E. & Miksch, E. D. (1961). **Restraint and treatment of young chimpanzees.**—J. Amer. vet. med. Ass. **138**, 653-658. **4203**

The authors describe the methods taken to restrain newly-imported young chimpanzees at the Aeromedical Field Laboratory, Holloman Air Force Base. Careful handling by at least two attendants suitably protected with gloves, the use of squeeze cages, and in some instances of anaesthetics and tranquillizers are recommended in handling strange animals. Usually after about 45 days forcible methods of restraint may be discontinued. A brief account is given of the main infectious conditions to be expected in these animals on arrival and advice is given on diagnosis, treatment and the best ways in which therapeutic agents may be administered to the animal.—R. N. Fiennes.

Wood, A. J., Nordan, H. C. & Cowan, I. McT. (1961). **The care and management of wild ungulates for experimental purposes.** — J. Wildlife Mgmt **25**, 295-302. **4204**

The authors described housing, breeding and feeding of deer at the University of British Columbia, Canada.—R.M.

Mann, I. (1961). **Some problems of by-product manufacture in less developed countries.** — Trop. Sci. **3**, 54-68. [Author's summary.] **4205**

The paper aims to dispel a widespread misconception in tropical countries that full use of animal offal can be achieved only with costly equipment, and under conditions comparable to those in large meat-packing factories. This attitude leads to the paradoxical situation that nutritious raw materials such as blood and bones are wasted, while expensive blood meal and bone meal are imported. Even hides and skins are sold and re-imported as finished leather. The benefits to be derived from hygienically produced by-products in terms of less malnutrition among human beings, healthier livestock, better crops and the creation of new industries, are described. The structural requirements for a modern by-products plant are stated and illustrated by a plan.

See also absts. **4220** (book, breeding and management of laboratory mice); **4221** (book, animal husbandry in Asia and the Americas).

TECHNIQUE AND APPARATUS

Shelley, W. B. & Florence, R. (1961). **Ethylene glycol monomethyl ether, a new fixative for histological work.**—Nature, Lond. **191**, 719-720. **4206**

Of 17 glycol ether fixatives studied, ethylene glycol monomethyl ether acetate was the best water-free coagulant fixative for mammalian tissue. Using standard paraffin embedding and staining techniques, it accentuated contrast, detail of cellular components and brightness of colour.—E.G.

Pullar, E. M. (1961). **Effect of delayed fixation on the measurement of bone ash.**—Aust. vet. J. **37**, 169-172. [Author's summary modified.] **4207**

There is a marked delay before desiccation and putrefaction produces an appreciable change in the measured bone ash content of unpreserved specimens. A spurious rise of up to 7% in the ash content occurs between the 5th and 15th days in mid-summer, but did not occur in up to 15 days in mid-winter or in refrigerated specimens. A simplified procedure for the despatch of specimens for ash estimation is described.

Bowen, H. J. M. & Cawse, P. A. (1961). **Determination of sodium, potassium and phosphorus in biological material by radioactivation.**—Analyst **86**, 506-512. [Authors' abst. modified.] **4208**

Neutron-activation analysis has been applied to the determination of sodium, potassium and phosphorus in biological material. Ultimate limits of sensitivity for the three elements were approximately 10^{-10}, 10^{-9} and 10^{-10}g, respectively. Radiochemical separation procedures were used, and it was possible to analyse eight samples for all three elements in an 8-hour working day.

REPORTS

Great Britain. (1961). **Ministry of Agriculture, Fisheries and Food. Department of Agriculture for Scotland. Report on the Animal Health Services in Great Britain, 1959.** pp. 116. London: H.M. Stat. Off. 6s. **4209**

As regards notifiable disease, the year was overshadowed by the worst epidemic of NEWCASTLE DISEASE ever known in this country. All told, 2,062 outbreaks entailed the slaughter of nearly five million birds and the destruction of close on one million hatching eggs. Compensation reached little less than £3½ million.

Regarding FOOT AND MOUTH DISEASE, the position was good, the number of outbreaks being the lowest since 1955. (On the Continent of Europe the disease has greatly diminished too and in France only a little more than 6,000 outbreaks were reported as compared with about 100,000 in 1957.)

ANTHRAX showed a sharp rise as compared with 1958. There were 263 outbreaks of which 105 were in Scotland. For the third year in succession SWINE FEVER increased, but only slightly. The demand for crystal violet vaccine is still going up. In the ten years, 1950–59, the annual issues have risen from 70,000 to 1,395,000 doses. Two outbreaks of ATROPHIC RHINITIS were reported and confirmed in pigs in 1959.

Bovine TUBERCULOSIS Eradication proceeded apace. During 1959 further strides in the eradication brought the plan close to fulfilment. At the end of the year some 75% of the cattle population were in attested areas which included about two-thirds of England and the whole of Scotland and Wales. Nearly ten million cattle or 95% of the National Herd were attested. In this period 346,675 store and fat cattle were imported into Britain from the Republic of Ireland—this figure including those which came *via* Northern Ireland. Of these 3,470 were accredited (*i.e.* attested) and 148,142 had passed a single tuberculin test immediately before shipment. The average incidence of reactors amongst once tested Irish cattle entering attested areas during 1959 was 2·9%.

The Report gives the regulations to prevent the introduction and the spread of disease and for the protection of animals during transit.

Nearly 50 pages are given over to the work of the Central Veterinary Laboratory at Weybridge and the Veterinary Laboratory at Lasswade, and to the report on the Veterinary Investigation Service. Work on ARTIFICIAL INSEMINATION by the Reading Cattle Breeding Centre is included.

There are 25 statistical appendices and 83 publications by members of the staff are listed.—D. S. RABAGLIATI.

Great Britain. (1960). **The West of Scotland Agricultural College. Report on the work of the College for the year ended 30th September, 1960.** pp. 91. Glasgow: The College. [Veterinary investigations pp. 60-67.] **4210**

The Veterinary Investigation Service examined 8,740 specimens at the Auchincruive Laboratory coming from a variety of animals, but largely from cattle. Amongst numerous diseases investigated were several outbreaks of PARASITIC ENTERITIS occurring in yearling steers during spring and early summer. The parasites chiefly concerned were *Ostertagia ostertagi* and *Nematodirus filicollis*. In one outbreak half of the affected stock died.

TICK-BORNE FEVER was diagnosed in a self-contained dairy herd. Since the beginning of August from 25 to 30 cows in all stages of lactation had a loss of milk yield and some pyrexia. Both milk yield and temperature returned to normal after 3 to 4 days.

Of 787 samples of faeces examined for JOHNE'S DISEASE 52 were positive, 11 suspicious and 742 negative.

LOUPING-ILL was widespread in hill lambs and cases occurred until the end of May. At least 14 outbreaks were diagnosed but probably many more occurred. A number of conditions were investigated in pigs.

COCCIDIOSIS and LEUCOSIS continued to be the main causes of death in poultry.

At the Sub-station in Oban 2,082 specimens were examined: LOUPING-ILL was an important cause of death in lambs (1–4 weeks of age).

The usual range of diseases were diagnosed in poultry. FOWL TYPHOID occurred in a deep-litter flock of 200 and after half the birds had died, it was decided to slaughter the flock.—D. S. RABAGLIATI.

Northern Ireland. (1960). **The research and experimental record of the Ministry of Agriculture, Northern Ireland for the year ended 31st December, 1959. Vol. IX. Part 2.** pp. 107-282. Belfast: Ministry of Agriculture. [Veterinary research pp. 227-242.] **4211**

Trichomoniasis in cattle has been virtually eradicated, and no outbreak was recorded in 1959. Only 4 outbreaks of Vibriosis in cattle were confirmed.

Gastro-enteritis (228 cases), followed by Pneumonia (69) were the commonest causes of death in pigs sent for examination. Swine Fever was not recorded. *Clostridium welchii* was responsible for 43 of the cases of gastro-enteritis, salmonella 12, *Balantidium coli* 6, vibrio 2, and trichomonas one. Of 122 strains of *Escherichia coli* isolated, 47 were typed; many of them were resistant to the broad spectrum antibiotics, sulpha drugs and, in some cases, nitrofurans. Type OK177 was demonstrated in 18 cases of Oedema Disease, and OK4 in 12. Poliomyelitis indicative of Talfan Disease was found in 5 piglets.

In 5,379 adult poultry Fowl Paralysis and Leucosis were the chief causes of death, in 3,235 chicks caecal Coccidiosis and respiratory conditions. Fowl Typhoid is widespread, and was confirmed on 20 breeding farms.

Clostridium welchii infection, Fasciolasis and Pneumonia due to *Pasteurella haemolytica* were the most important diseases in sheep sent for examination. *Mycobacterium johnei* was demonstrated in 3 of 200 slaughter sheep. Epididymitis usually due to streptococci and staphylococci was found in 20% of rams. *Brucella ovis* has not been encountered. There were 5 outbreaks of Copper Poisoning in sheep and 3 in calves caused by feeding pig meal containing copper.—M.G.G.

Nigeria. (1961). **Annual Report on the Veterinary Division of the Ministry of Animal Health and Forestry of the Northern Region of Nigeria for the year 1957-58.** pp. 22. Kaduna: Govt. Printer. 9d. **4212**

The general disease position remained satisfactory in that although outbreaks of the major epizootic diseases did increase, in no case was mortality heavy and extensions of all outbreaks were limited. The year was marked by the integration of the Veterinary Department under the Ministry of Animal Health and Forestry.

The general pattern of Rinderpest throughout the region differed little from that of the previous year. A total of 360 outbreaks occurred and 819,953 cattle were immunized. Bovine Contagious Pleuropneumonia still remains a major issue in Bornu Province where it is endemic. In 212 outbreaks, 2,655 animals died.

The control of Trypanosomiasis still places a heavy strain on the resources of the Provincial veterinary staff, the number of treatments reaching 771,438 as compared with 578,685 in 1956–57. Both ethidium chloride and quinapyramine sulphate were in common use.

Among bacterial diseases the most commonly diagnosed was Blackleg but there were 69 deaths from Anthrax out of 13 outbreaks. Accurate data on Tuberculosis of livestock are still lacking, most cases having been diagnosed at slaughter.

Epizootic Lymphangitis was again a frequent disease where horses were numerous. Trypanosomiasis continued to be diagnosed in areas where contact with *G. palpalis* and *G. tachinoides* was possible.

—D. S. Rabagliati.

Western Nigeria. (1961). **Annual report of the Livestock Division of the Ministry of Agriculture and Natural Resources, 1958-59.** pp. 38. Ibadan: Govt. Printer. 1s. **4213**

On April 1st 1958 the Department of Agriculture was split up into three main divisions covering Extension, Research and Livestock. The main limitation on the activities of the Division has been the acute shortage of Livestock and Veterinary Officers.

The most serious cattle diseases were two outbreaks of Rinderpest, six deaths from Blackleg and one outbreak of Haemorrhagic Septicaemia in a herd of 37 animals, all of which were affected.

In sheep and goats four main conditions occur, Enteritis, Pneumonia, Foot Rot and Dermatitis. The first two conditions have shown response to sulphadimidine.

Poultry suffer from Fowl Pox, Visceral Lymphamatosis and Coccidiosis.

Trypanosomiasis is found in all parts of the region and cattle, horses, pigs and dogs have been treated for it.

Rabies vaccination is done free in all classes of economic livestock and, because of public health risk, dogs and cats.

A regional diagnostic unit was completed during the year but shortage of professional staff has prevented it from being opened. The Report contains a number of statistical tables.

If the Region is to be satisfactorily served, eight veterinarians are required for duty in the Provinces.—D. S. Rabagliati.

Zanzibar Protectorate. (1960). **Annual Report of the Department of Agriculture for the year**

1959. [Briant, A. K.] pp. 44. Zanzibar: Govt. Printer. Shs. 2. [Items of veterinary interest pp. 24-26.] **4214**

There was no change in the strength of the Veterinary Section of the Department and it continued to provide veterinary attention at five centres in Pemba and Zanzibar. There were no outbreaks of contagious disease during the year. TUBERCULOSIS was seen in three cows; and one bull died from the disease.

Prophylactic treatments included 3,418 trypanosome injections with antrycide prosalt and 150 with prothidium as well as 2,234 vaccinations against NEWCASTLE DISEASE in poultry.

Dipping and spraying against tick-borne diseases continued. Gammexane (BHC) was in general use for district spraying; toxaphene was also used but was less efficient.

BABESIOSIS is not a very important disease in native cattle kept in rural environment but it is invariably severe in high grade cattle of the commercial dairy herd and in the dipped or sprayed zebu herds of the Department. So far there is no sign of resistance of cattle ticks to the acaricides.

The blood of wild animals has been examined for trypanosomes. If *T. simiae* is not present and is capable of causing mortality in wild bush pigs, its introduction might be a means of destroying wild bush pigs which act as trypanosome carriers.

EPIZOOTIC LYMPHANGITIS which has been diagnosed clinically was confirmed in a donkey.

Some heavy losses from NEWCASTLE DISEASE occurred in Zanzibar, but Pemba apparently remained free.—D. S. RABAGLIATI.

BOOK REVIEWS

Butler, E. J. & Bisby, G. R. Revised by Vasudeva, R. S. (1960). **The fungi of India.** pp. ix+552. New Delhi: Indian Council of Agricultural Research. Rupees 45.50. **4215**

This book records nearly 4,000 species of fungi and it has a bibliography of 1,500 references. It is written mainly for the plant pathologist and there appears to have been little attempt to include animal pathogens. For example, there is no mention of the reports from India of *Histoplasma farcinimosum* (Singh, 1956 and others), *H. capsulatum* (Shortt, 1923), *Nocardia farcinica* (Holmes, 1908 and Raymond, 1910), actinomycosis, and dermatophytes of animals. Rao's work on rhinosporidiosis of cattle (1938) is listed in the bibliography but not cited in the text.

—R.M.

Smythe, R. H. (1961). **Animal vision. What animals see.** pp. 250. London: Herbert Jenkins. 25s. **4216**

This book deals with the types of eyes that exist in the animal kingdom, the influence of vision on animal behaviour; and the types of image that animals might perceive. It is written in simple language and is designed for the general reader. There are 102 illustrations based on sketches drawn by the author. Veterinary surgeons will find this book easy to read, and it is packed with interesting information.—R.M.

Bressou, C. (1961). Aide-mémoire d'ostéologie comparée des animaux domestiques. **[Guide to comparative osteology of the domestic animals.]** pp. 110. Paris: Vigot Frères. 2nd Edit. **4217**

This guide for veterinary students contains basic information on anatomy of the skeleton and species differences in horse, ox, goat, pig, dog, cat and rabbit. There is also a section on birds. The text is accompanied by 245 drawings.—R.M.

Lerche, M., Bartels, H. & Kelch, F. [Edited by.] (1961). A. Schroeter/M. Hellich. Das Fleischbeschaugesetz, nebst zusätzlichen Verordnungen und Gesetzen, mit Erläuterungen. Teil III. **[Meat inspection law, with explanations. Part III.]** pp. vii+186. Berlin (& Hamburg): Paul Parey. 7th Edit. DM 22. **4218**

For reviews of Parts I and II of this four-volume work, see *V.B.* **30,** 312 and **31,** 1666. Part III deals with Section B of the German meat inspection law (instruction and examination of meat inspectors and trichinella inspectors) and also new regulations about the inspection of imported meat and methods for cooked and pickled meat. There are notes on examination of animals that have been used for preparation of sera and vaccines.—R.M.

Lane-Petter, W. (1961). **Provision of laboratory animals for research: a practical guide.** pp. xii+147. Amsterdam (London, New York & Princeton): Elsevier Publishing Company. 20s. **4219**

This monograph is written for depart-

mental heads and scientific administrators who are responsible for the provision of laboratory animals. The first 4 chapters review the uses of laboratory animals, their sources and cost, and the increasing demand both for quantity and for quality. The 7 main chapters deal with the control of the quality of laboratory animals, with regard to genetics, health, nutrition, physical environment, and the care that they receive, the qualifications and training of animal technicians, the technique of producing laboratory animals of high quality in two stages; the primary type colony and the production units, and the functions and advantages of national laboratory animal centres. The final chapter discusses humane considerations, legal control, and public relations. A bibliography of the most important standard works on laboratory animals and a subject index are appended.

—M.G.G.

Broustail, M. (1961). La souris de laboratoire et son élevage. **[The breeding and management of laboratory mice.]** pp. 70. Paris: Vigot Frères. 2nd Edit. **4220**

This book covers the general principles of the breeding, nutrition and management of laboratory mice, and describes the different diseases and parasites.—M.G.G.

Bonadonna, T. (1961). Viaggio "zootecnico" intorno al mondo in Asia e nelle Americhe. **[Report on a tour to study animal husbandry in Asia and the Americas.]** pp. xvi + 311. Milan: Edizioni "Progress Zootecnico". **4221**

This is a collection of 41 papers, which have been published in Italian agricultural journals, of the author's impressions of animal husbandry and related topics in India, the Philippines, Japan and the South American countries. There are 49 illustrations.—R.M.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

Habermehl, K.-H. (1961). Die Altersbestimmung bei Haustieren, Pelztieren und beim jagdbaren Wild. **[Determination of age in domestic animals and poultry, fur-bearing animals and game animals and birds.]** pp. 223. Berlin (& Hamburg): Paul Parey. DM 25.80.

Hoffmann, G. (1961). Histologischer Kurs. Kurze Einführung in die Histologie und mikroskopische Anatomie der Haus- und Laboratoriumstiere. Tiel II. Mikroskopische Anatomie. **[Histology of domestic and laboratory animals. Part II. Microscopic anatomy.]** pp. viii + 159. Jena: Gustav Fischer. DM 31.70.

Kauffman, F. (1961). Die Bakteriologie der Salmonella- Species. **[Bacteriology of Salmonella.]** pp. 255. Copenhagen: Munksgaard. Dan. Kr. 48.

Noble, E. R. & Noble, G. A. (1961). **Parasitology: the biology of animal parasites.** pp 767. London: Henry Kimpton. 82s. 6d.

Waterson, A. P. (1961). **Introduction to animal virology.** pp. viii + 96. Cambridge: University Press. 22s. 6d.

Wright, J. G. & Hall, L. W. (1961). **Veterinary anaesthesia and analgesia.** pp. viii + 386. London: Baillière, Tindall & Cox. 5th Edit 37s. 6d.

Zumpt, F. [Edited by] (1961). **The arthropod parasites of vertebrates in Africa south of the Sahara (Ethiopian region). Volume I (Chelicerata).** pp. 457. Johannesburg: South African Institute for Medical Research. R6.00.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey, Surrey.

AUTHOR INDEX

(The numbers refer to abstracts and not to pages. Where a page number appears after an author's name it refers to an entry in the list of books received)

SUBJECT INDEX

ERRATA

page 55, abstract 313. Translation of title should read: Allergic reaction to intracutaneous albumose-free standard tuberculin . . . . .

page 198, abstract 1141. Lissot, M. G. should read Lissot, G.

page 533, abstract 2963. Change 'J. Dairy Sci. 28' to 'Science 133'.

pages 614-615, abstract 3438. The author of this work is F. Paredis and not M. Vandeplassche.

page 717, abstract 4019. Lines 2 and 3 of abst. should read: bilirubin content per 100 ml. serum was 0.13 mg. and the average total content 0.4 mg.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey, Surrey.